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TICK-BORNE RELAPSING FEVER ON THE WITWATERSRAND GOLD MINES

ITS TREATMENT WITH AUREOMYCIN

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The Central hospital of the Witwatersrand Native Labour Association medically examines approximately 300,000 Native labourers per year on their way to and from the mines of the Witwatersrand. Of these roughly one-third are recruited from areas outside the Union of South Africa, mainly from Portuguese East Africa, but also from a wide area extending across Africa south of latitude 10° S. Many tropical diseases are therefore encountered which do not normally occur in the South African Bantu to any great extent.

One of these diseases is tick-borne relapsing fever which, while occurring only sporadically in the Union, is endemic in many other parts of Southern Africa and indeed, according to my investigations, appears to be more prevalent in many countries than was originally realized. For example, it has been calculated from my statistics, taken amongst apparently healthy male adults arriving on the mines, that 1 : 200 Shangaans from Portuguese East Africa suffer from the disease, 1 : 170 natives from Nyasaland, and 1 : 350 from Northern Rhodesia. This in all probability represents the minimum incidence. It will be appreciated, therefore, that relapsing fever on the Witwatersrand Gold Mines is prevalent and, although the disease has in most cases reached a chronic stage by the time that the native labourers arrive at the W.N.L.A. Hospital, it is nevertheless responsible for a high morbidity if not a high mortality. For the welfare of the mines, as well as from the humanitarian aspect, it is important to assess the relative values of the different drugs available in the treatment of this disease.

The Disease. The disease, by the time the native labourer has arrived in Johannesburg, has reached a chronic stage and only in a small percentage of cases are the acute symptoms seen. In most cases a complaint of headache is associated with a pyrexia of 101° F. to 103° F., a pulse rate of 90 to 110 per minute, and a splenic enlargement of two to three fingers below the costal margin. The spleen is rarely tender, but is associated with a slight enlargement of the liver in about 20% of cases which in turn is accompanied by a mild degree of jaundice (10%) and a tendency to haemorrhage. Epistaxis occurs in nearly 50% of cases, usually during the pyrexial period, whilst haematuria and haemoptysis are occasional symptoms. Of complications, signs of lobar or bronchopneumonia are seen in 5% of cases, whilst eye signs such as conjunctivitis, iritis, and irido-cyclitis are fairly common. One case of relapsing fever meningitis has been encountered in this series.

The average duration of the pyrexia is from 12 to 72 hours, at the end of which time the patient appears fit and, apart from the splenomegaly, shows no evidence of the disease; 70% of my series of cases show a relapse in from three to 18 days, the average apyrexial period being 9½ days. With the relapse there is a return of the previous symptoms, with apparently no diminution in the pyrexia or severity of the disease; and, with intermediate apyrexial periods, a third, fourth, fifth and sixth relapse may occur. Owing to limited hospital accommodation and the difficulty of an adequate follow-up once the case has been discharged to duty on the mines, it has not proved possible to assess the ultimate state of most cases. Of my series of 100 cases, however, five have had six relapses before leaving hospital and one case had no fewer than eight relapses before being repatriated.

Diagnosis. The diagnosis of all cases, including

relapses, is made by thick or thin blood smears taken during the pyrexial period, and stained with Leishman's or Giemsa's stain. The spirochaete is easily recognized but is frequently extremely scarce and requires long search even in the thick preparation. In addition, confirmation of the diagnosis has been made in many cases by a positive complement fixation test, testing the patient's serum against a suspension of *Spirochaeta duttoni* prepared from egg cultures of this organism. These tests were carried out at the Institute for Medical Research.

Treatment. The following drugs have been tried in the treatment of the disease, given for the most part during the pyrexial period:

Mapharside, Neo-salvarsan, N.A.B., Neoarsphenamine	Arsenicals
Sulphadiazine, Sulphathiazole	Sulpha drugs.
Penicillin, Aureomycin	Antibiotics
Anthiomalin, Chloroquin, Mepacrine	Anti-protozoal and anti-parasitic drugs.

It is generally accepted that the arsenical drugs are effective in varying degrees against the acute stages of relapsing fever, but, in my experience, this does not hold good in the chronic stages of the disease as seen on the mines. Thus amongst 40 cases treated with varying doses of one or other of the arsenical drugs, the relapse rate is 62% as compared with 73% amongst untreated cases.

Penicillin in doses of 200,000-2,000,000 units gives a relapse rate of 75% in 20 cases, whilst other drugs, including some of the sulphonamides, anthiomalin, chloroquin, and mepacrine, give a relapse rate of 72% in 20 cases.

The overall relapse rate amongst treated and untreated cases, therefore, shows that 70.5% have one or more relapses, the distribution being as follows:

	Cases	*% Showing One or More Relapses*
Arsenical drugs	40	62
Penicillin	20	75
Sulphonamides or Anthiomalin and Anti-protozoal drugs	20	72
Untreated	20	73
Total	100	70·5

Aureomycin Treatment. As far as can be ascertained, no reports have yet been published on the effect of the antibiotic, aureomycin, on the *Spirochaeta duttoni*. Heilman[1] showed that it appears to be highly effective against the *Spirochaeta novyi* which produces relapsing fever in mice, and against an experimental leptospira in hamsters. Since then, other workers have shown that the drug appears to have an action on the *Spirochaeta pallida*, but reports are as yet scanty. From this, however, and from the fact that no suitable treatment had been found up to the advent of aureomycin, it was decided to try the effect of this antibiotic on the apparently resistant strain of the *Spirochaeta duttoni*.

Dosage and Method of Administration. Amongst the earlier cases, at which time the dosage was a little uncertain, experiments were made with an initially large dose of 8 capsules (2 grammes) followed by 1 capsule (0.25 gramme) every four hours whilst the pyrexia lasted. Since the spirochaetes appear only to be present in the blood stream during the pyrexial period, the drug was suspended after the temperature had been normal for six hours. Two cases which had received the large initial dose complained of some nausea and vomiting, whilst one case showed a marked pyrexial reaction within 24 hours of the administration of the drug. It was decided, therefore, to standardize the dose to an initial two capsules (0.5 gramme) followed by one capsule every four hours until the temperature had been normal for 12 hours. The capsules were given orally and no other medicinal treatment was administered. The average total dosage given per case over the series of 25 cases was only 12 capsules (3 grammes) which, it is appreciated, is a small dosage. This was governed, however, partly by the short pyrexial period in which to administer the drug, partly by the difficulty in obtaining supplies in the earlier stages of the experiment and partly by the expense of the drug.

Effects. It was apparent early in the experiment that a favourable reaction was being obtained. The pyrexia, which was around 103° F. at the commencement of treatment, fell rapidly by crisis, accompanied by profuse sweating and was, as a rule, normal within 24 hours. This compared favourably with untreated cases whose average pyrexial period was 48 hours and in whom the pyrexia fell by lysis. With the fall in temperature there was a rapid amelioration of symptoms.

Amongst the 25 treated cases only three showed a relapse (i.e. 12% relapse rate). Of these, one which was a comparatively severe case with iritis, enlarged liver and jaundice, relapsed in 24 days after having received 3.5 grammes. One relapsed 15 days after having only 1.5 grammes of aureomycin but had no further relapse after a second course of treatment with 3.0 grammes. One relapsed 12 days after a single dose of 1.0 gramme.

Of the remaining 22 cases no relapses occurred within three weeks of treatment representing an 88% non-relapse rate, which is a 54% improvement on cases treated with other drugs. In addition, one case which has not been included in the series of 25 cases, relapsed after receiving 3.0 grammes during the apyrexial period. This was the only case treated outside the pyrexial period and appeared to indicate that the spirochaeticidal effect of the drug is more marked when the spirochaetes are present in the blood stream.

In addition to the relapse rate, other encouraging signs of the action of the drug have been noted. Following treatment there is a rapid diminution in the size of the spleen and in most cases the spleen is no longer palpable three weeks after completion of the treatment. Whilst it is appreciated that the splenic

index is somewhat unreliable, especially in view of the high malarial incidence amongst these cases, it is nevertheless interesting to note that whilst the splenic index fell from 64% to 8% in the three weeks after treatment with aureomycin, the index only fell from 68% to 57% in the case reacted with other drugs.

A further interesting point was the marked increase in weight immediately following treatment. All cases were given an iron tonic together with a vitamin and protein mixture in addition to their standard hospital diet, and weights were taken over the three-week period following treatment. The comparative figures were as follows:

Group	Cases	Average Gain in Weight during Three Weeks after the last Relapse
1	Relapse cases (treated with other drugs or untreated)	1.8 lb.
2	Non-relapse cases (untreated) ...	3.6 lb.
3	Cases treated with aureomycin	6.1 lb.

It appeared that the cases which showed no relapse were probably those which had initially slight infection or which had developed a high resistance to the disease and it was not surprising, therefore, that the increase in weight was higher than those in Group 1. The gain in weight following aureomycin treatment appeared significant.

Conclusion. In spite of the small number of cases treated and the small dosage of drug administered per case, it appears suggestive from these results that aureomycin has a spirochaeticidal effect on the *Spirochaeta duttoni*. It is thought likely that a more concentrated course of treatment with a larger dosage of drug administered would eliminate the spirochaetes altogether from the body, and experiments are now being carried out on these lines. The effect of aureomycin on the complement fixation titre has not yet been observed and it is hoped to follow this up in the near future; but from the rapid diminution in the size of the spleen it would appear possible that there is a rapid drop in titre. It would also be interesting to try the effect of aureomycin on the acute stages of the disease and it is hoped that an opportunity will arise to try it on the commonly fatal condition of relapsing fever meningitis.

SUMMARY

1. A description of tick-borne relapsing fever as it occurs on the Witwatersrand Gold Mines is given.

2. The effect of various drugs in the treatment of the disease is assessed.

3. The treatment of 25 cases with aureomycin appears to indicate a spirochaeticidal effect on the *Spirochaeta duttoni*.

My thanks are due to Dr. J. H. S. Gear for carrying out the complement fixation tests.

REFERENCE

1. Heilman, F. R. (1948): Aureomycin in the Treatment of Experimental Relapsing Fever and Leptospirosis Icterhaemonhagica (Weil's disease), Proc. Staff Meet. Mayo Clin., **23**, 569.

ABSTRACT

Taliaferro, W. H., Taliaferro, L. Graves, and Kelsey, F. E. (1949): *The Role of the Spleen and the Lymphoid-Macrophage System in the Quinine Treatment of Gallinaceum Malaria.* Journal Infectious Diseases, **83** (1948), 164; **84** (1949, 187.

I. *Acquired immunity and phagocytosis.* The author experimented with normal (non-splenectomized) and splenectomized chickens, infecting them with *P. gallinaceum*, and then treating them with quinine, along with adequate control groups.

His results suggest (*a*) that the spleen and quinine act more or less independently in suppressing infection; (*b*) that quinine does not act *indirectly* on the parasites either by (1) stimulating acquired immunity, (2) by non-specifically stimulating the macrophages to greater phagocytic activity, or (3) by producing an opsonin-like action on the parasite.

Results, however, emphasize the importance of acquired immunity as an auxiliary to the antimalarial activity of quinine.

II. *Quinine blood levels.* In this paper the authors report the results of experiments on the course of infection with *P. gallinaceum* in splenectomized and normal chickens, with and without treatment with quinine, especially as regards quinine blood level.

These experiments corroborated the results of those reported in paper I. Splenectomy decreased acquired immunity without affecting innate immunity against infection with *P. gallinaceum*. Splenectomized chickens had a higher blood level than normal infected chickens.

The addition of acquired immunity increased the suppression during quinine treatment just as its reduction decreased it. The experiments make improbable the assumption that the reticulo-endothelial system absorbs and redistributes quinine in a manner that facilitates a better drug-parasite contact.

III. *The action of quinine and of immunity on the parasites.* The third paper records a new series of experiments with the same strain of parasites in splenectomized and non-splenectomized chickens.

The authors came to the following conclusions:

1. Three antimalarial factors operate independently during quinine treatment: innate immunity, acquired immunity, and quinine.

2. During innate immunity in untreated normal and splenectomized chickens the rate of reproduction of the parasite was high.

3. When acquired immunity was superimposed on innate immunity in untreated normal and splenectomized chickens the rate of reproduction of the parasites was almost as high as during innate immunity only.

4. When quinine was given before infection, its antiplasmodial activity persisted as long as it remained in high concentrations in the blood. Quinine acts directly on the parasite without metabolic transformation.

5. The standard dose of quinine (1.25 mg. of quinine base intravenously per 100 gm. chicken daily, on three consecutive days) effected a total concentration of 10 to 18 mg./L. blood for 5 hours each day. Its effects on the parasites reached a maximum of 12 to 24 hours after the last dose and gradually decreased during the following three days. Quinine acted similarly in splenectomized chickens.

6. The assumption that quinine is converted *in vivo* into a more active product, or that the drug makes the parasites more vulnerable to phagocytosis, is not substantiated.

7. The independent antiplasmodial action of acquired immunity and quinine is indicated by the following:

(*a*) Each acted in the absence of the other.

(*b*) Splenectomy increased the death rate and parasitemia equally in treated and untreated chickens.

(*c*) Quinine decreased death rate and parasitemia equally in splenectomized and in intact chickens.

(*d*) Acquired immunity predominantly killed parasites and quinine predominantly inhibited their reproduction.

(*e*) Splenectomy increased quinine efficacy but decreased acquired immunity.

(*f*) Acquired immunity was not necessary for the efficient action of quinine, but was necessary to prevent relapses after the drug was stopped.

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VAN DIE REDAKSIE

DIE VROEË GESKIEDENIS VAN DIE *SUID-AFRIKAANSE TYDSKRIF VIR GENEESKUNDE*

Reeds in 1847 het die verspreide geneeshere in hierdie land met 'n klein kwartaalblad begin onder redaksie van dr. Ebden, die destyds erkende leier van die beroep in Suid-Afrika, en dr. W. Darley-Hartley [1] verwys na vier nommers wat die blad se kort bestaan van een jaar te boek gestel het.

Die jaar 1847 was sekerlik 'n tyd van woeling in die kolonie. Een van die bedrywige sentrums was Grahamstad waar 'n lewenskragtige *Medico Chirurgical Society* deur die energieke dr. W. G. Atherstone gestig is. Dr. Atherstone het in Junie 1847 koloniale geskiedenis gemaak deur die Adjunk-balju van Albanie se been met sukses bokant die knie af te sit deur eter as algemene narkose vir die doel te gebruik,[2] binne nege maande nadat dit vir die eerste keer in Boston deur dr. Morton gedemonstreer is.

Dit skyn of mediese joernalistiek vir 'n tydperk verdwyn het met die mislukking van dr. Ebden se pogings, totdat dr. W. Darley-Hartley self in 1884 met 'n *South African Medical Journal* te Oos-Londen begin het. Alhoewel die blad vir die eerste jaar maandeliks verskyn het, het dit daarna, hoe eienaardig dit ook al mag klink, in 'n weekblad verander wat te Cathcart uitgegee is ,en eindelik na 'n bestaan van vyf jaar aan kragverlies gesterf het'. Daar was toe nog 'n gaping wat tot Mei 1893 geduur het, toe 'n ander *South African Medical Journal* van stapel gestuur is.

Die eerste uitgawe van hierdie *South African Medical Journal*, destyds 'n maandblad, wat beskryf is as gewy aan die belange van die mediese beroep in Suid-Afrika en onder redaksie van dr. Alexander Edington van Grahamstad, is deur mnre. Juta en Kie., Kaapstad, in Mei 1893 gepubliseer. Dit het blykbaar ontwikkel uit 'n voorstel wat dr. Arthur Fuller van Kimberley gedoen het op die eerste Suid-Afrikaanse Mediese Kongres wat in verband met die Kimberley-skou gehou is. Dr. Fuller se voorstel vir die stigting van 'n Suid-Afrikaanse Mediese Vereniging is verwerp, maar aan die voorstel dat *The South African Medical Journal* gestig word, is gevolg gegee.

Die jaarlikse inskrywingsgeld van hierdie *maandelikse* tydskrif was een ghienie en afsonderlike eksemplare is teen 2s. 6d. verkoop. Dit is interessant om hierdie gelde met die huidige te vergelyk waar lede van die

1. *The South African Medical Record*, 15 Maart 1903, bl. 8.
2. *Grahamstown Journal*, 19 Junie 1847.

EDITORIAL

THE EARLY HISTORY OF THE *SOUTH AFRICAN MEDICAL JOURNAL*

As far back as 1847 the scattered medical men in this country started a small quarterly publication under the editorship of Dr. Ebden, the then acknowledged leader of the profession in South Africa, and Dr. W. Darley-Hartley [1] refers to four numbers recording its brief existence for one year.

The year 1847 was certainly a time of ferment in the Colony. One of the active centres was Grahamstown, where a vigorous Medico Chirurgical Society was established by the energetic Dr. W. G. Atherstone. Dr. Atherstone made colonial history in June 1847 by successfully amputating above the knee the leg of the Deputy Sheriff of Albany, using ether as a general anaesthetic for the purpose, within nine months of its first demonstration in Boston by Dr. Morton.[2]

Medical journalism, however, seems to have gone into an eclipse, with the failure of Dr. Ebden's efforts, until 1884 when Dr. W. Darley-Hartley himself started a *South African Medical Journal* at East London. Although this publication appeared monthly for the first year, it then changed, remarkable to relate, into a weekly publication issued from Cathcart, 'and finally perished of asthenia after five years' existence'. There was then another gap which lasted until May 1893, when another *South African Medical Journal* was launched.

The first issue of this *South African Medical Journal*, then a monthly publication described as devoted to the interest of the medical profession of South Africa, under the editorship of Dr. Alexander Edington of Grahamstown, was published by Messrs. Juta and Company, Cape Town, in May 1893. It apparently developed as a result of a motion by Dr. Arthur Fuller of Kimberley, proposed at the first South African Medical Congress held in connexion with the Kimberley Exhibition. Dr. Fuller's motion for the formation of a South African Medical Association was negatived, but the proposal to establish *The South African Medical Journal* was implemented.

The annual subscription for this *monthly* journal

1. *The South African Medical Record*, 15 March 1903, p. 8.
2. *Grahamstown Journal*, 19 June 1847.

UMI

Vereniging nog 21s. per jaar betaal maar vir 'n *weeklikse* tydskrif en 1s. 6d. vir afsonderlike eksemplare.

Dr. Fuller het 'n artikel tot die eerste uitgawe van hierdie herleefde *Journal* bygedra onder die opskrif *A Medical Journal for South Africa* waarin hy die redes aangegee het waarom hy ‚die aantal verhandelinge wat dien om ons reeds oorvol snippermandjie te voorsien van half geleesde mediese tydskriflektuur vermeerder'. Onder andere het hy die volgende belangwekkende opmerkings gemaak ter ondersteuning van die voorgenome nuwe *Journal* en sy opmerkings was destyds so gepas as wat hulle nou, 57 jaar later is: ‚Ons het 'n sekere stadium in ons ontwikkeling bereik waar ons nie meer tevrede is om in stede en dorpe wortel te skiet, om verouderd te word weens gebrek aan aanraking met die idees van ander mense en om toe te laat dat ons regeer word sonder dat ons plaaslike behoeftes in ag geneem word nie.

Die *Medical Board* (d.w.s. die ekwivalent van 'n Geneeskundige Raad) soos hy op die oomblik saamgestel is, is 'n liggaam wat vir sy optrede verantwoordelik gehou word en by elke hoek en draai deur die beroep dwarsdeur die kolonie gekritiseer word en dit is vir homself sowel as vir die mediese broederskap dwarsdeur die land goed dat dit so moet wees.'[3]

Dit skyn dus of die werklike stoot wat uiteindelik volslae sukses behaal het, dus by die Mediese Kongres wat te Kimberley gehou is, gegee is waar dr. Fuller met die vorige pogings om 'n *Journal* te stig in gedagte, nie nagelaat het om ‚'n woordjie van lof vir die kloekmoedige pogings van dr. Darley-Hartley om 'n tydskrif aan die beroep te verskaf en van spyt oor die ontydige verdwyning daarvan' uit te spreek nie.[3]

Die Anglo-Boere-Oorlog het ook in die wêreld van die kliniese joernalistiek verwarring gebring en die Bestuur van die destydse *South African Medical Association* het besluit om publikasie vir die eerste ses maande van 1900 te staak.[4]

In 1903 het sake weer hulle normale loop begin neem toe 'n maandblad, *The South African Medical Record* genoem, deur die redakteur dr. W. Darley-Hartley van Lloyds-gebou, Langstraat, Kaapstad, gepubliseer is.[5] Dit was 'n heeltemal private onderneming wat uiteindelik verenig is met die amptelike orgaan, *The Journal of the Medical Association of South Africa* (*B.M.A.*), wat op 8 Januarie 1927 onder die gesamentlike redaksie van dr. W. Darley-Hartley en dr. C. Louis Leipoldt gepubliseer is.

Wat waarskynlik die finale verandering in die naam van die *Tydskrif* is, het voorgekom toe daar 'n atavistiese terugkeer na die oorspronklike titel aan die begin van 1932 was en ons weer die naam *The South African Medical Journal* (*Die Suid-Afrikaanse Tydskrif vir Geneeskunde*) aangeneem het en hierdie blad het tot aan die begin van 1949 voortbestaan as 'n tweeweeklikse uitgawe, toe dit na die weekbladstatus teruggekeer het wat hy voorheen, 65 jaar gelede, in Cathcart geniet het.

3. *The South African Medical Journal*, Mei 1893, bl. 3.
4. *The South African Medical Journal*, Desember 1899, bl. 167.
5. *The South African Medical Record*, 15 Maart 1903.

was one guinea, and single copies sold at 2s. 6d. These rates make an interesting comparison with the position to-day, when members of the Association still pay 21s. a year, but for a *weekly* journal, and 1s. 6d. for single copies.

Dr. Fuller contributed to the first issue of this revived *Journal* an article under the title *A Medical Journal for South Africa*, in which he set out the reasons for adding to 'the number of papers which go to supply our already overflowing waste-paper basket of half-read medical magazine literature'. *Inter alia*, he made the following interesting observations, in support of the proposed new *Journal* and his remarks were as pertinent then as they are now, 57 years later: 'We have arrived at a certain stage in our development at which we are no longer content to settle down in our towns and villages, growing musty for want of contact with the ideas of other men, and allowing ourselves to be governed without reference to our local needs.

The Medical Board (i.e. the equivalent of a Medical Council) as at present constituted is a body held responsible for its actions, and criticized at every step and turn by the profession all through the colony, and it is good for itself and the medical fraternity throughout the country that it should be so.'[3]

The real impetus which finally achieved complete success thus seems to have been imparted at the first Medical Congress held at Kimberley, when Dr. Fuller, mindful of previous attempts to establish a Journal, did not omit 'a word of praise for the gallant efforts of Dr. Darley-Hartley to provide the profession with a journal, and of regret for its untimely disappearance'.[3]

The Boer War produced a dislocation also in the world of clinical journalism and the Executive of the then South African Medical Association decided to suspend publication for the first six months of 1900.[4] The march of events was then resumed in 1903 as a monthly journal called *The South African Medical Record* and published by the editor Dr. W. Darley-Hartley, of Lloyds' Chambers, Long Street, Cape Town.[5] It was an entirely private undertaking which was eventually absorbed into the official publication called *The Journal of the Medical Association of South Africa* (*B.M.A.*), and which was published on 8 January 1927 under the joint editorship of Dr. W. Darley-Hartley and Dr. C. Louis Leipoldt.

What is probably the final change in the name of the *Journal*, when there was an atavistic reversion to the original title, occurred at the beginning of 1932 when we re-assumed the name of *The South African Medical Journal*, this publication continuing as a fortnightly periodical until the beginning of 1949, when it again reverted to the weekly status it had enjoyed formerly in Cathcart 65 years ago.

3. *The South African Medical Journal*, May 1893, p. 3.
4. *The South African Medical Journal*, December 1899, p. 167.
5. *The South African Medical Record*, 15 March 1903.

UMI

Daar is baie in hierdie vroeë blaaie wat vir ons vandag van groot belang is. Baie van die probleme waarvoor ons kollegas 60 jaar gelede te staan gekom het, is nog in ons midde en die soortgelyke moeilikhede wat die beroep destyds ondervind het, het voorstelle vir hulle oplossing uitgelok wat bewoord is in taal wat baie dekades daarna feitlik dieselfde is. Die voorneme bestaan dus om van tyd tot tyd uittreksels van ons geskakeerde en interessante geskiedenis uit hierdie en ander blaaie in die *Tydskrif* te publiseer. Dit sal gepubliseer word onder die opskrif *Echoes from the Past* en ons hoop dat dit van meer as tydelike belang vir ons lesers sal wees.

There is much in these early records that is of great interest for us to-day. Many of the problems which our colleagues faced over 60 years ago, are still with us, and the similarity of the difficulties the profession experienced then, called forth at that time proposals for their remedy couched in language almost identical with that offered many decades later. It is proposed, therefore, to reprint in the *Journal*, from time to time, extracts of these and other early records of our varied and interesting history. These will be published under the title *Echoes from the Past*, and we hope that they will prove of more than passing interest to our readers.

URINARY INFECTIONS IN GENERAL PRACTICE*

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The problem of infections of the urinary tract is one which frequently presents itself in practice while the multiplicity of therapeutic measures which have come into being, some to remain and many to go, are an indication of the difficulties in ensuring a cure in all cases.

The title has been suggested advisedly for it is to the general practitioner that the majority of such cases in the first place come, while to him is credit due when a cure comes about; credit, because he will have himself provided the requisite treatment, or, where indicated, directed his patient into those avenues where the more specialised measures are available, such measures frequently needing the closest co-operation between physician, urologist and pathologist.

The scope of the communication is of necessity limited and cannot contain the detailed investigations and treatment of the urologist; nor is it possible to cover the whole problem of infections of the urinary tract but the general practitioners view-point will be an essential aspect; the first aim will be a consideration of steps to be taken during the all important early stages of treatment, and secondly, an appreciation of those clinical features which indicate either the need for special investigations before perseverance with further conservative measures, or the necessity of more radical, even operative, treatment as a primary therapeutic measure, without which, conservative measures however prolonged or drastic will inevitable fail.

TYPE OF ORGANISM

A knowledge of the infecting organism should be always carried in mind, without this failure may become certain from the beginning or valuable time be wasted on unsuitable treatment.

Although the *Bacillus coli* is the commonest, other organisms of the coli—typhoid group may be met, as in the case of a patient with recurrent attacks of left sided pyelitis which, over a period of a year, had failed to respond to the usual measures until eventually the urine was found to give a pure growth of *Bacillus typhosus;* this organism when persisting as a urinary infection usually settles upon a predisposing cause. In this case it was a hydronephrosis which was subsequently removed and is shown in Figure 1. Within a brief period the patient was cured and remained so permanently.

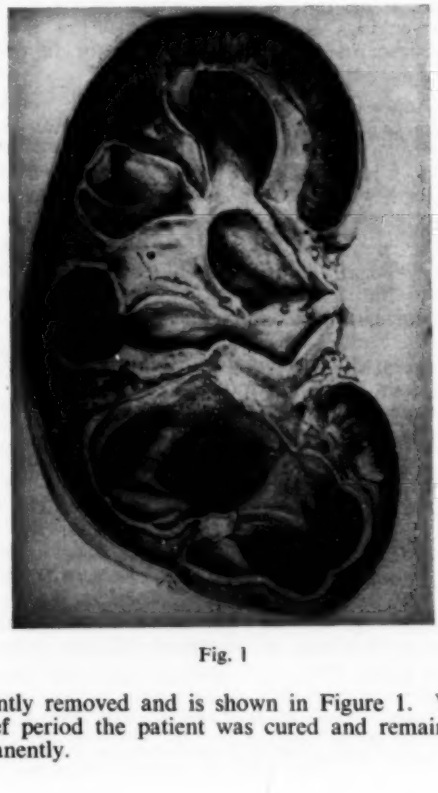

Fig. 1

* This paper was read at the Medical Congress of the Association held at Cape Town in September 1949.
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Bacillus proteus and other urea-splitting organisms, characterised by the foul alkaline urine, are usually resistant to therapy although readily sterilised *in vitro*.

Staphylococci, which are second in frequency to *Bacillus coli* and are sometimes urea-splitting, also *Streptococcus faecalis* with an incidence of 10—12% are similarly met in certain cases and demand their specific measures of treatment.

The introduction of the drugs of the sulphonamide group has materially assisted the treatment of urinary infections; each practitioner may have his personal predilection for one or other of these particular drugs while the idiosyncrasy of the patient to certain drugs, has ever to be carried in mind.

Instances do occur in which an organism of the *Bacillus coli* type normally responsive to one of the sulphonamides is found to be unaffected by a course of treatment; in such a case it may be found sensitive either to another allied drug of the group or to another drug altogether, rapid improvement and indeed cure following.

In such instances it may be well to seek pathological assistance to test the drugs to which the infecting organism is sensitive, and thus save the patient tedious investigation for an underlying predisposing cause which does not exist.

CLINICAL EXAMINATION

The necessity of a routine examination and history can never be over-emphasised but in deference to practitioners who are eventually faced with non-response to conservative measures, it is only just to appreciate that the same common underlying causes are frequently undetectable by normal clinical procedures as will be seen in the following table.

This table represents a consecutive series of 50 cases which, having failed to respond to conservative measures warranted specialised review:

Unilateral Infection

Hydronephrosis	17
Hydro-ureter	5
Renal Calculus	3
Ureteric Calculus	3
No abnormality	3
	31

Bilateral Infection

Hydronephrosis (unilateral)	4
Hydro-ureter (bilateral)	1
Hydro-ureter (bilateral). Pregnancy	1
Hydro-ureter (bilateral). Urethral Valve	1
No abnormality	8
	15

Vesical Infection Only

Diverticulum	1
Cervicitis	1
Fibroids	1
No abnormality	1
	4
Grand Total	50

At the same time it is again fair to emphasise that by routine clinical examination a large number of conditions can be readily diagnosed which are clearly a primary predisposing cause needing radical measures as opposed to the conservative treatment applicable to the urinary infecting organism *per se*, while the necessity of seeking and eliminating the usual sources of 'septic foci' is an integral part of a general clinical review of the patient.

The following table represents a consecutive series of 100 cases, excluding cases seen in the acute phase of pyelitis, coming to a hospital where the urine was found to be infected and where examination revealed the cause in the first place:

Lower Urinary Tract Conditions

Enlarged Prostate	30
Urethral Stricture	12
Pregnancy	3
Vesical Calculus	2
Vesical Diverticulum	2
Carcinoma of the Prostate	1
	50

Upper Urinary Tract Conditions

Renal Calculus	33
Hydronephrosis	7
Growths of Kidney	4
Mobile Kidney	3
Ureteric Calculus	2
Ureteric Stricture	1
	50

Grand Total	100

TREATMENT

Hygiene. The importance of confining the patient to bed until the criteria of cure are noted can hardly be over estimated but by some, especially the patient, is inadequately appreciated. This is of special importance in patients with their first attack of acute pyelitis or pyelo-cystitis, who should remain so confined until the urine is not only sterile but has a centrifuge deposit clear of pus cells; unless this last feature is ensured not only is a recurrence likely, but the onset of chronicity, with all its sequelae of ill health, is more than a possibility.

It is appreciated how a symptom-free patient, so often young and outwardly healthy, is loath to remain in bed awaiting the disappearance of pus cells but here the professional skill of the general practitioner, based on his clinical knowledge, stands paramount in treatment.

Diet. In an average adult the fluid intake should be brought up to six pints in the 24 hours in the form of water—barley water or fruit drinks. Weak tea is permissible but large quantities of strong tea or coffee are not recommended. The total fluid intake may have to be restricted when certain drugs are used.

In the acute stage fluids alone are recommended; as this phase passes, carbohydrate may be added together with fat, as bread, biscuits, honey, butter and cream; milk should be avoided and alcohol forbidden.

In the later or more chronic stage fruit and vegetables are added to the diet together with small quantities of chicken, but other animal protein should be restricted.

In long-standing cases where patients are losing faith in the accepted measures, results have followed the administration of bacilli which form lactic acid in the bowel such as *Bacillus Bulgaricus* in yoghurt or the *Bacillus Acidophilus* of which preparations are available e.g. Acidophilus milk.

SPECIAL TREATMENT

At one time autogenous vaccines were popular, but on reviewing the results over a period one can only be disappointed.

Drugs. The value of alkali by mouth especially during the acute stage has long been recognised for its excellent symptomatic value; given as potassium citrate and potassium bicarbonate in quantities sufficient to alkalinise the urine to litmus, the temperature is made to fall and the pain and discomfort to disappear even though the urine remains unaffected until sterilised by other measures; where these other measures are drugs of the sulphonamide group, the two treatments may be combined but when mandelic acid therapy is contemplated this cannot be begun until the alkalis have been discontinued.

Before embarking upon energetic treatment, it is as well to assess the renal function where this is in doubt, either as a result of clinical appreciation or the presence of abnormal urinary constituents over and above the infecting organism and pus cells. This may be of importance in selecting the type of drug to be used, as for example, sulphamezathine is useful in the presence of poor renal function as it is quite effective in low concentration in the urine. Again, should the diminished renal function show itself in a lowering of the blood alkali reserve, it is better not to use mandelic acid therapy with or without ammonium chloride; similarly in infection with urea-splitting organisms, persistence with mandelic acid and acidifying agents, while being useless, will only tend to encourage phosphatic deposition in the urinary tract and calculus formation with consequent renal damage.

FLUID INTAKE AND OUTPUT

Fluid control, already discussed under diet, is important, as when urinary antiseptics are used the concentration is important; while mandelates are being used fluid intake is often restricted to two or three pints per day, but this may make the patient uncomfortable when the fluid restriction must be relaxed. Fluid rationing is contra-indicated when sulphonamides are used, and an intake of four to five pints per day under temperate conditions is necessary to prevent complications.

URINARY ANTISEPTICS

When one considers the criteria of an 'ideal' urinary antiseptic there is little wonder that no such ideal drug has as yet been discovered, it can however be accepted that our pharmaceutical armamentarium can be divided into groups, by a judicious use of wh'ch the treatment of urinary infections has of recent years achieved a very fair degree of success.

1. Hexamine, Pyridium, etc.
2. Mandelic Acid preparations.
3. The Sulphonamide drugs.
4. Antibiotics—Penicillin and Streptomycin.

The dyes methylene blue, pyridium and similar preparations although exerting a degree of effect are no longer in much use in view of those recent advances which give better results.

Hexamine. Hexamine in an acid medium however still finds a place, particularly in patients who have an alkaline urine with a suprapubic cystostomy; as the Hexamine and acid are best not dispensed together the former is often given in tablet form and the acid in a mixture, for example:

Ac. Sodae Phosph:	gr. XX
Ac. Bor:	gr. V
Spr. Chlorof:	Min. X
Infus. Buchu:	ad. ½ oz.

Signe

½ oz. t.d.s.p.c.

The addition of ammonium chloride, given in cachet form to increase the acidity of the urine as a means of enhancing the effect of hexamine, should be used with caution as, besides tending to an acidosis, it may irritate the kidney to the extent of causing haematuria and pain.

Mandelic Acid Preparations. Mandelic acid first used in 1935, when it replaced the ketogenic diet, soon found favour and still retains a place in treatment of most of the common organisms; it is indeed of particular use in cases infected with *Streptococcus Faecalis*, of no use in cases of *B. Proteus* while the staphylococci respond better to other drugs.

Its one disadvantage is the necessity of a strongly acid urine medium having *p*H of 5.3 or less; such urine is acid to methyl red which can in practice be easily estimated by the special test papers made for this purpose or one of the comparators on the market; as the whole success of mandelic acid therapy depends on maintenance of the correct urinary acidity this is an important practical aspect of treatment, failure to obtain the correct acidity suggesting:

a. Inadequate acidifying drugs.
b. Renal failure.
c. Infection with urea-splitting organism.

The maintenance of such acidity often needing additional ammonium chloride should be watched carefully where renal deficiency is suspected, as already discussed; in such cases it is unlikely that adequate urinary acidity will be obtained and it is as well not to use the drug under such conditions.

Mandelic acid is inadvisable during the acute febrile phase where the fluid restriction and acidosis will be an added and unnecessary burden to the patient.

The drug is administered as sodium mandelate gr. 45 q.i.d. or in the more palatable forms of ammonium mandelate as a syrup placed on the market in a proprietary form 'Mandelix' or as calcium mandelate sold as 'Mandecal' which is a powder.

The Sulphonamides. The introduction of these drugs has made for great changes in the treatment of urinary infections; most of the preparations are readily ab-

sorbed and rapidly excreted by the kidneys resulting in a high urinary concentration, even to saturation, with a minimal oral intake of the drug.

Whichever preparation is used, a dose of 1 gramme four times per day is usually adequate although an initial amount of 2 grammes is often used; with this dosage and free diuresis of an alkaline urine, the anxiety of precipitation in the renal tubules with its dangerous sequelae is removed. The alkalinity is maintained with adequate doses of potassium citrate four-hourly which, in addition to making for safety, greatly enhances the efficacy of the drug.

Of the many derivatives available sulphanilamide, sulphathiazole, sulphadiazine, sulphamezathine and sulphacetamide, the first is now little used being less potent than the newer ones and not so comfortable for the patient as cyanosis is a possibility.

All these sulphonamide drugs are effective against the usual organisms of the coli—typhoid group; sulphathiazole and sulphadiazine are useful against the staphylococci and of some value in *Bacillus Pyocyaneus* and *Bacillus Proteus* infections; none are however of much use against *Streptococcus Faecalis* although sulphathiazole is in this instance sometimes of value in an acid urine. However, as other means are available against this organism sulphathiazole is not recommended.

Viewed generally, sulphathiazole and sulphadiazine can form insoluble acetyl derivatives, which are more liable to precipitate in the kidney than in the case of sulphamezathine which is thus much favoured for routine administration.

Dangers of Sulphonamides. This precipitation is not common with the relatively small doses used in urinary infections provided the precautions mentioned are observed; on the other hand if by renal colic or haematuria precipitation is suspected, occurring as it may within the first 24 hours, immediate steps must be taken to stop the drug and increase diuresis of alkaline urine; while severe symptoms or oliguria demand the attention of the urologist as an emergency at the earliest opportunity in order that any deposits packing the urinary passages may be washed out by ureteric catheterisation before the mechanical blockage becomes advanced, because when it occurs in the renal tubules it is of serious import.

In view of the relatively short period usually needed to treat urinary infections, the danger of toxic effects such as agranulocytosis is not great although in very sick patients the leucocyte count should be watched.

Penicillin. Except in high doses this is not very effctive in cases of infection with coliform organisms and is therefore not the method of choice; it is however very effective against the *Staphylococci Aureus* and *Albus.*

Streptomycin. Unlike penicillin this is effective against the coliform bacilli, on the other hand perhaps its important value is in the case of the resistant *Bacillus Proteus* towards which its effect is encouraging.

Intensive treatment for a short period is recommended, e.g. doses of 1 to 3 grammes per day.

Choice of Drug. The above considerations may be of assistance or the following table act as a guide to choice of drug and a measure of the success to be anticipated.

Therapeutic Agent	*Bacillus Coli*	*Strepto-coccus Faecalis*	*Staphylococcus Albus*	*Staphylococcus Aureus*	*Bacillus Proteus*
Mandelic Acid	‡	†	†		
Sulphonamides	‡		†		?†
Penicillin ..			†	‡	
Streptomycin					†

‡ Recommended as first choice with sincere hope of success.
† Recommended with reasonable hope of success or at least improvement. (It should be noted that due regard is given to the expense and availability of streptomycin in recommending it to be reserved for the so resistant Proteus infection).

CAUSES OF FAILURE OR RELAPSE

1. Inadequate or Incorrect Treatment.
2. Impaired Renal Function.
3. Nature of Organism.
4. Underlying Urological Abnormality.
5. Special Cases.

In the skilled hands of the practitioner guided by the basic knowledge of the principles of treatment already set out, the majority of urinary infections clear and remain so, leaving uncured the 'Special cases' and those in 'Group 4' in which, at this stage, further specialised investigations become essential—pyelograms, cystoscopy, etc. Although this type of case comes outside the scope of this particular communication it may be here emphasised that in the presence of underlying urological abnormality, especially stasis, conservative measures though temporarily effective cannot lead to a permanent cure.

SPECIAL CASES

Pyelitis of Pregnancy and Puerperium. The enlargement of the ureters and resulting urinary stasis is a vital factor in the infections of pregnancy, here the infection usually responds well to alkalis and sulphonamides combined with postural drainage: in the last the patient remains prone in bed with foot raised.

Relapse is not uncommon but should not cause undue anxiety as the infection can be kept in check by further periods of treatment until the confinement: although persistence far into the puerperium calls for energetic measures. Fortunately therapeutic measures during pregnancy and puerperium are based upon those principles already set out while there is no evidence to suggest that either mandelic acid or the sulphonamides given to a mother cause harm to her breast-fed baby.

RESISTANT INFECTIONS

These consist of the relatively small group where infections persist in a urinary tract which is anatomically within normal limits, also in cases where the urological abnormality cannot be rectified and in certain diseases of the central nervous system.

Here the prognosis can be improved first by bringing the infection under control and then keeping it in check

by regular administration of a 'Maintenance Dose' of one of the drugs already discussed; where the sulphonamides are of value for instance, a daily dose of ½ to 1 gramme daily (in an adult) of sulphamezathine will keep the bacteria count at a minimum, prevent relapse and be without danger to the patient whose health is considerably improved. (This dose is best devided and given b.d.).

CONCLUSION

This communication is intended to review the therapeutic and diagnostic measures available and indeed necessary for treatment of urinary infections in general practice also to act as an interpretation of the implications of failure to cure and thereby the necessity of proceeding on to more complex and costly special investigations.

ABDOMINAL TRAUMA

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War has always resulted in much being written on abdominal trauma and many of the lessons gleaned from this are not appreciated by the surgeons in peace-time. In presenting this series we wish to illustrate by our cases and our errors certain principles which we feel have not been fully realized.

It is interesting to note that we in South Africa, especially in the non-European hospitals, have received a large number of abdominal stab wounds. However, the New Orleans Charity Hospital admitted 1,352 penetrating abdominal wounds between January 1927 and January 1948. Here again 76.5% were negroes.

Many of our cases have multiple stabs, i.e. stomach and liver or stomach and colon. In considering these in their groups we have placed them in the group of the organ most affected. Many cases have associated injuries, such as major fractures and head injuries.

All these cases have been operated on by the surgical units of this hospital and their methods and ideas do not always agree with ours. The period reviewed is from 1 May 1948 to 31 August 1949.

One hundred and forty-five cases make up this series consisting of injuries caused by stab wounds, gun-shot wounds and blunt trauma. In the latter case. injury was either caused by a true crush or by a kick or blow with a stick or fist (Table 1).

TABLE I

Stab Wounds:		*Blunt Trauma:*	
Abdominal wall ..	25	Traumatic injury to liver	3
Penetrating wounds ..	35	Traumatic rupture of spleen	4
Perforating wounds ..	49	Traumatic perforation of ileum	6
Soft tissues .. .. (Perineum, 1; Kidney, 2)	3	Kidney contusion ..	2
Shot Wounds:		Ruptured urethra ..	7
Abdominal wall ..	4	Massive trauma ..	3
Penetrating wounds ..	1		
Perforating wounds ..	3		

INJURIES TO THE ABDOMINAL WALL

Although many cases are seen in the Casualty Department of this hospital only 29 were admitted for operation (25 were for stab wounds and 4 for gun-shot wounds).

Most of these wounds occur in the left upper abdomen or left loin. These 29 cases are included because the patients were admitted for exploration as the differentiation between a wound of the abdominal wall and a penetrating wound can at times be very difficult.

THE DIAGNOSIS OF INTRA-ABDOMINAL INJURY

As unnecessary laparotomy carries a mortality and morbidity, careful consideration must be given to the accurate diagnosis of injuries to the abdomen.

1. *The Wound.* (*a*) *Site.* In this series we have found that the majority of these wounds are situated on the left side of the abdomen. This is readily understood by the fact that in most cases, due to stabbing, the assailant has been positioned in front of the victim. In these cases the site often gives a clue to the viscus damaged.

TABLE II

Sites of Stab or Gun-shot Wounds

Thoraco-abdominal ..	25	Flanks	23
Upper abdomen	54	Buttocks	2
Lower abdomen (below the umbilicus) ..	11	Perineum	1

It must be borne in mind that wounds as high as the sixth rib in the axillary line may involve the abdominal viscera. We have experienced some considerable difficulty in assessing thoraco-abdominal wounds especially when a haemothorax and diaphragmatic irritation has resulted in reflex splinting of the anterior abdominal wall.

A case recently seen by one of us illustrates this point.

Case Report. J.M., a Bantu male aged 21, was admitted on 17 September 1949 with a history of having been stabbed over the right eye and in the left chest (sixth interspace, mid-axillary line) the previous evening. Laceration was present

below right eye. The stab wound of the chest did not appear to have perforated the chest as there were no respiratory signs and no surgical emphysema around the wound. Blood Pressure: 120/78 mm. Hg. Thirty-six hours after having been stabbed, the patient began to vomit. His abdomen was not distended and bowel sounds were present. Slight rigidity was present in the left hypochondrium. When seen on the 20 September the patient was still vomiting and although his temperature was subsiding, his white cell count was 16,000 per c.mm.

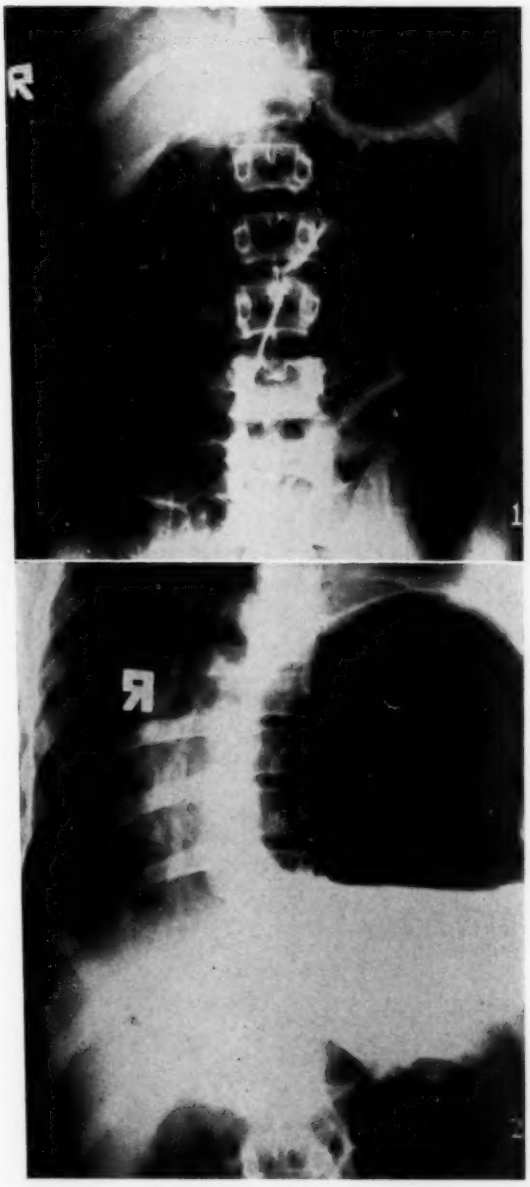

Fig. 1. This shows depression of the left diaphragm and the gas shadow above.
Fig. 2. The whole of the left chest cavity is filled with the stomach.

Flat X-ray of his abdomen was then done (Figs. 1 and 2) and from this a diagnosis of strangulating diaphragmatic hernia was made.

On operation, through a Garlock thoraco-abdominal incision, it was found that the stomach was acutely dilated and congested and occupied the whole left chest. The stomach, hepatic flexure and spleen had passed through a rent in the diaphragm and the stomach had strangulated.

The stomach, colon and spleen were reduced into the abdomen and the spleen was found to have a rent of 2½". Splenectomy was performed. The diaphragm was sutured and the wound was closed. Except for a small effusion—the patient made an uneventful recovery.

The diagnosis of strangulated diaphragmatic hernia could not have been detected as early as it was, without the use of X-rays.

These thoraco-abdominal wounds are most prone to involve the liver on the right side and the stomach and spleen on the left.

(*b*) *Entrance and Exit Wounds.* Tracing the track of a gun-shot wound is of value in assessing the damage inflicted. These, however, have not been prominent in this series. From war experience we know that the missile often takes a bizarre course from the point of entrance, as bony prominences can deflect the missile in any direction.

In one of the cases reviewed the entrance wound was in the left buttock and on laparotomy it was found that the patient had four perforations of the distal colon, which were successfully sutured.

One should always question the patient about the position he was in at the time of receiving the wound. Laufman states that only 6% of buttock wounds involve the rectum and a patient with an extra-peritoneal perforation of the rectum may not show any signs at the time of the first examination.

(*c*) *Prolapsing Viscera or Omentum.* It has been taught that if there is omentum protruding from a stab wound, there is rarely a perforating injury beneath. We have not found this so (Table III).

It is noteworthy that the prolapsing part in the majority of cases has not been the viscus damaged.

Of five cases which at operation showed perforating injuries of large bowel, two had a small bowel prolapse and in three the omentum was protruding.

The same was true of small bowel perforations when the prolapsing omentum or bowel was generally unscathed.

2. *The Silent Abdomen.* This, we would say, is one of the most important signs of intra-abdominal injury. Auscultation of the abdomen must be performed religiously in every case suspected of having an internal injury. The absence of peristaltic sounds over a three-minute period, repeated and confirmed is an absolute indication for abdominal exploration. We would also like to stress that the presence of sounds is not a contra-indication to operation. Robb states in his series that in only 1.5% of cases without hollow visceral lesion was peristalsis absent. In those cases with a lesion of a hollow viscus 91.4% had a silent abdomen. In five cases, however, hollow visceral damage was present and peristaltic sounds were heard. He also gives an illustrative case of a large perforation of the stomach with peristaltic sounds and concludes with the following

statement: 'The absence of peristaltic sounds, confirmed and reconfirmed is a positive indication for laparotomy, but the presence of peristaltic signs is only a valuable guide towards and not a positive indication for, conservative treatment.'

3 *Abdominal Rigidity.* Most of these injuries have been received during or shortly after a drinking bout, when nausea and vomiting is often due to the 'skokiaan' consumed. It has been noticed that pain and rigidity can be suppressed by alcohol.

Pain and rigidity are often associated with a penetrating stab wound of the chest and retro-peritoneal injuries, even without any intra-abdominal trauma. Extraperitoneal haematoma may simulate intra-abdominal injury.

When the haematoma involves the anterior abdominal wall, rigidity and tenderness is often present, sometimes surgical emphysema can be detected. Careful examination, however, can help to distinguish this.

In posterior extraperitoneal haematomata, mild rigidity is often noticed. Peristaltic sounds may be present, but paralytic ileus may supervene, requiring continuous intestinal syphonage and hydration therapy. Rigidity may be absent in shock but appears when the patient's condition improves.

4. *Shock and Haemorrhage.* Rapid pulse, pallor, thirst, restlessness indicate active internal haemorrhage. Bleeding occurred most frequently in this series from liver, spleen and mesentery.

In assessing shock, we have found the *M.R.C. War Memorandum on Traumatic Shock* useful.

Mild shock or none, blood pressure over 110 mm. Hg. Pulse less than 100 per minute.
Moderate shock, blood pressure less than 110 mm. Hg. Pulse over 100 per minute.
Severe, blood pressure less than 70 mm. Hg. Pulse over 120.
} Objective signs of shock.

If, after adequate shock treatment including blood replacement, there is no general improvement over a two-hour period, there must be some active causative factors requiring operation without further delay.

Jarvis describes four such mechanisms.

i. Continuous haemorrhage.

ii. Gross faecal contamination of the peritoneum.

iii. Cardiorespiratory embarrassment from thoracic injury.

iv. Early fulminating anaerobic gas forming infection.

5. A rectal examination may divulge information and should not be omitted.

6. In every abdominal injury the patient must be asked to voluntary void urine and if necessary a catheter should be passed to exclude kidney, bladder and urethral injury.

7. *Radiological Examination.* Generally radiological examination is not necessary but has proved of occasional value. Obliteration of liver dullness is detected clinically and saves moving an ill patient. At times, however, it has been of extreme value as can be seen in the case described previously.

PENETRATING WOUNDS OF THE ABDOMEN

The term 'penetrating wound' is used to distinguish these wounds from 'perforating wounds' in which a viscus is damaged. It is extremely difficult to distinguish the two pre-operatively and the cases are presented here with the post-operative diagnosis.

We agree with Gordon Taylor who states 'that whatever the traumatic agency, laceration, spike or stake, a stab with the knife, etc., general principles of treatment are alike. A penetrating wound of the abdomen probably means a penetration of bowel and any other abdominal viscus and demands the earliest surgical intervention, unless the wisdom of prescience born of great experience justifies restraint'.

Thirty-six cases of penetrating wounds (Table III) are reviewed here and in 50% omentum was protruding; in six varying lengths of bowel were protruding. Some stress has been placed by some units in this hospital on the value of bowel sounds, but we have learnt to our cost that the presence of bowel sounds do not indicate intact gut.

Guarding and rigidity varied from case to case in this series and gave no definite indication of perforated viscus. The factors preventing the onset of rigidity are shock and drunkenness. A large percentage of these patients are extremely intoxicated when stabbed and guarding is not marked in these cases even if visceral damage is present. Shock and alcohol mask the onset of early peritonism and a badly shocked patient will only develop rigidity when the condition improves.

Approximately half these patients were shocked and 60% were very intoxicated. Four cases in this group were treated conservatively—excision of the protruding omentum and a simple closure of the stab wound. Here this line of treatment was successful. We would, however, again like to stress that the only way to rule out a perforation of a hollow viscus is laparotomy.

TABLE III

Site.	*Injury.*	*No. of Cases*		*Death*	
Abdominal wall	Gun shot wounds	4	29	Nil	
	Stab wounds	25			
Penetrating wounds	Gun shot wounds	1	36	1	
	Stab wounds	35			
Perforating wounds:					
Stomach	Stab wounds	16		5	
Liver	Stab wounds	14	17	4	One of these deaths is recorded under "Stomach".
	Blunt trauma	3			
Spleen	Stab wounds	2	6	1	2
	Blunt injury	4		1	
Small intestine	Stab wounds	9		1	
	Gun shot wounds	2	17	1	3
	Blunt injury	6		1	
Colon	Stab wounds	6	7	1	
	Gun shot wounds	1			
Kidney	Stab wounds	2	4	Nil	
	Blunt injury	2			
Massive Trauma	(Multiple Fractures + other injuries)	3		2	
Urethra	Blunt trauma	7	8	2	
	Stab wound	1			

In 18 of these cases where bowel sounds were listened for and recorded, they were present in 12 and absent in six. In one case borborygmi were present and on laparotomy it was found that brisk bleeding was present from a gastro-epiploic vessel.

Ogilvie (1944) found that all penetrating wounds of the abdomen are potentially infected and tend to breakdown. This is more so with transverse incisions. We have had similar experience and advise a paramedian exploratory incision.

Jolly (1941) states that there is no indication for conservative treatment of gun-shot wounds of the abdomen, except:—

1. Those with well-advanced general peritonitis.
2. Moribund cases.
3. Those in which there are additional wounds incompatible with life.

This series only includes one gun-shot wound. The one death in this series is a case of a thoraco-abdominal wound which when explored showed no visceral damage. He subsequently developed a large extraperitoneal abscess which was drained. However, he died of toxaemia.

PERFORATING WOUNDS: INJURIES TO THE LIVER

In this series there were 19 cases with five deaths—the one death being a stab wound of the liver associated with a stab wound of the stomach and is recorded under stab wounds perforating stomach (Table II).

These wounds were usually in the right hypochondium or right lower chest and were associated with marked shock. The patients required resuscitation before exploration could be done. A rent in the liver can be repaired in many different ways—suturing with mattress sutures or suturing over an oxycel pack. The use of non-absorbable packs is contraindicated as they always cause sepsis and are unsatisfactory. In most of the cases of this group, bleeding could be controlled by the use of an oxycel pack which is placed in the laceration and is sufficient to stop any further oozing. Stitching of this oxycel pack into the wound in small lacerations is unnecessary, but if bleeding is brisk, haemostatic sutures of thick catgut with a liver suturing needle is necessary.

Prognosis. Rodney Maingot (1948) states that subcutaneous injuries are more lethal than penetrating wounds, mainly due to the difficulties in diagnosis. He also states that the mortality is between 30-50% for penetrating wounds of the liver. Dean Lewis and Trimble (1933) recorded 20 cases (14 of which were operated on with six deaths) 40% mortality. Boyce and McFetridge (quoted by Maingot) report 43 cases with 19 deaths—44.2%, and Ogilvie (1944) 43 cases with 21 deaths—49%. In our small series (Table IV), the mortality was 26.2%.

The Drainage of Liver Wounds. This subject is controversial as in our series, in seven cases (uncomplicated by other injuries), none was drained and only one death resulted, i.e. 14.3% mortality. Jarvis (1946), however, stated that the most important consideration, regardless of the size of the lesion, has been to conduct the bile to the surface. Griswald (1943) writing on this subject also stresses the importance of drainage, and Jarvis also notes that in one case of injury to the liver, drainage continued for 73 days.

STAB WOUNDS OF THE LIVER (TABLE IV)*

Patient	*Age*	*Repair*	*Drainage*	*Stay in Hospital (days)*	*Concomitant Injury*	*Result*
1. A34023 H.K.	35	Suture with oxycel	Drain to area	8	Nil	Satisfactory
2. 5557 G.T. ..	±42	Suture of liver	Nil	21	Nil	Satisfactory
3. 2916 N.N.	30	Suture with oxycel	Nil	1	Nil	*Death*
4. A15358 A.M.	28	Plugged with oxycel	Nil	15	Nil	Satisfactory
5. 13779 E.C.	23	Stitched with oxycel	Nil	7	(i) Two perforations of stomach (ii) Evisceration on sixth day	*Death*
6. A17470 L.K.	?	Not sutured	2 drains	12 hours	Eight incised wounds of ileum	*Death*
7. A10688 C.M.	24	Oxycel sutured	Nil	13	Nil	Satisfactory
8. A3044	25	Not sutured	Nil	17	Nil	Satisfactory
9. 12718 P.M.	29	Sutured	Nil	17	Nil	Satisfactory
10. A9654 A.M.	?	Sutured	Nil	1	(i) Lacerated stomach (ii) Peritoneal soiling+++	*Death*
11. A13230 E.M.	24	Not sutured	Nil	15	Serosal wall of stomach	Satisfactory
12. A3 Y.K.	24	Sutured	Nil	30	(i) Large perforation of stomach (ii) Subserosal tear, hepatic flexure of colon	Satisfactory
13. 11901 S.G.	30	Sutured	Nil	21	Large perforation of stomach	Satisfactory
14. 6009 J.M.	30	Suture with oxycel pack	Nil	5	(i) Large perforation of stomach (ii) Evisceration on 5th day	*Death*
15. A34054	30	Oxycel	Yes	9	Nil	Satisfactory
16. A29998	27	Sutured and oxycel	Nil	41	Nil	Satisfactory
17. A21889	±30	Oxycel	Nil	48	Multiple fractures	Satisfactory
18. A4795 S.T.	36	Sutured	Nil	20	Nil	Satisfactory
19. 19387 S.D.	22	Sutured	Nil	18 days.	Nil	Satisfactory

*Two additional cases have been added.

We feel that drainage should always be instituted down to the injured area of the liver and success of non-drainage in this series was mainly due to the antibiotics preventing a biliary peritonitis developing as every stab wound must be regarded as potentially infected.

The majority of surgeons drain after simple cholecystectomy as the biliary ooze from this controlled wound is sufficient to necessitate this. No gun-shot wounds occurred in this group, and all these wounds were caused by stabs with a knife. In the cases that died, only one was unassociated with any other injury.

INJURIES TO THE SPLEEN

Six cases are reported, four of which resulted from blunt trauma and two from stab wounds. There were two deaths, the one occurring six days after operation, showed at autopsy typhoid ulcers occurring in the ileum. At operation, the coincidental lesion was not noted, but the spleen was enlarged and was possibly rendered more vulnerable to the trauma sustained.

Histological section of another spleen successfully removed (A30617) following injury by blunt trauma revealed malarial changes.

All six cases were treated by splenectomy. Delayed rupture by the spleen was well exemplified in one of our cases where the signs of immediate injury abated and on the fifth day after admission signs of internal haemorrhage appeared. The spleen at operation was fragmented within its capsule; a large sub-capsular haematoma had arrested the bleeding, later to burst the capsule with resultant haemorrhage.

The notorious 'friable pedicle' is encountered in these delayed cases. Individual transfixion ligatures are less likely to cut out than a single mass ligature. A thoraco-abdominal exposure, dividing the eighth costal cartilage was used in two cases with low chest stab wounds. This gives an admirable exposure; avoids any necessity for heavy retraction and 'tugging' and in knife wounds allows excellent access to the stomach and splenic flexure. We feel that it is only by a thoraco-abdominal exposure that a diaphragmatic rent can be adequately closed and the full damage resulting from low chest stab wounds accurately assessed.

STAB WOUNDS IN THE STOMACH

In this series the stomach was the most frequent organ involved, 16 cases occurring. Three cases occurred with additional stabs (two with stab wounds of the liver and one with a stab into the hepatic flexure of the colon). The mortality was high, five cases in 16 (31.25%).

The reason for the high frequency that the stomach is involved in these wounds, is that the most frequent stabs are in the left lower chest or left upper abdomen and in many of the patients the stomach is distended making it the most prominent viscus. In these cases shock was marked and in those cases where shock was profound, death usually occurred in spite of resuscitation and operation.

Certain factors must be recognized:—

1. Most of these patients had a large quantity of alcohol when they were stabbed and those that died had much soiling of the peritoneum.

2. The cause of shock was mainly due to the sudden flooding of the peritnoeum with Kaffir beer and the depth of shock was an indication of the soiling.

3. In posterior perforations (of which there were three) the ability to wall off is much less common as the omentum cannot seal the perforation and soiling is more prolonged.

4. As these patients were shocked and alcoholic, rigidity was not very marked and the natural splinting that occurs with a perforated peptic ulcer did not occur and dissemination was more widespread.

In the five cases which died, four died in the first 48 hours, the remaining one died on the fifth post-operative day. In only one of these five cases was a second organ affected. This one was associated with a stab in the liver.

Treatment. None of these cases required more than a simple suture of the perforation, usually a two-layer closure with an invaginating Lembert suture was used. The lesser sac must be opened and the posterior surface of stomach inspected for either a posterior perforation or a through and through wound.

In some cases a thoraco-abdominal incision, such as described by Garlock was used. The chief post-operative danger is an acute dilatation of the stomach and in two of our personal cases, we feel this was the cause of death. All these cases should have a duodenal tube passed before going to the theatre or soon afterwards and continuous gastric suction instituted. A thorough toilet of the peritoneum by means of suction should be done at operation and all loose gastric content removed.

Drainage is not usually indicated.

INJURIES TO SMALL BOWEL (TABLE V)

Seventeen cases are reviewed: Nine cases due to stab wounds, two due to gun-shot wounds and six due to blunt trauma, the latter all being due to kicks on the abdomen.

There were three deaths.

Injuries to the small gut occurred with almost the same frequency as stomach lesions (16, Table 3). The three deaths all occurred within hours of operation from a stab wound, gun-shot wound and blunt injury respectively. In each case there was a gross peritoneal soiling—the 'syndrome of overwhelming contamination' as described by Jarvis (1946). 'The patient is admitted severely shocked and there is little or no response to intravenous replacement therapy. Laparotomy reveals a large quantity of foul faecal-stained blood. The peritoneum has a lustreless purplish colour and the loops of the bowel are intensely hyperaemic. The patient fails to rally from the peripheral circulatory failure and death supervenes in 24 hours.'

The six cases of blunt injury were all due to kicks and showed lesions in the lower small bowel. In all, but one, were confined to the ileum. The mechanism of injury is that a coil of bowel, unprotected by abdominal muscle contraction, is suddenly squeezed

between the vertebral column and the traumatising boot. The terminal ileum and the upper jejunum are said to be the parts most liable to injury by virtue of their relative fixity. In our six cases, however, the lesions were found in freely mobile bowel.

At operation the whole length of bowel must be visualized, without undue exteriorisation so that further perforations and mesenteric lacerations are not overlooked. The perforations are tagged with Allis forceps and at the completion of the abdominal survey, repair is begun.

In only three cases was it necessary to resect, the majority of lesions being closed in the transverse bowel axis with a double layer of sutures.

We have noticed that very many of these assault victims are infested with round worms and as Ascaris Lumbricoides has been known to digest catgut we have made it a practice to use non-absorbable suture material for repair and resection.

In two of our cases free worms were removed from the peritoneal cavity at operation. For peritoneal toilet we rely on the mechanical sucker and close the abdomen without drainage or the installation of penicillin or sulphonamide powder.

TABLE V: TABLE SMALL BOWEL INJURIES

Case	*Nature of Trauma*	*Shock*	*Sounds*	*Evisceration*	*Site of Injury*	*Operation Done*	*Complications*	*Lived*	*Died*	*Time of Death*
1.	Stab wound	Moderate	Not noted	9″ small gut	Multiple ileal perforation	Removal free ascaris. Suture ileal perforations. Suture mesentery. Suture rectal serosa	Pelvic abscess	Lived		
2.	Stab wound	Moderate	Negative	Nil	Post duodenal perforation. Tear mesentery, nick kidney	Suture duodenum. Suture mesentery	Wound dihisence	Lived		
3.	Stab wound	Moderate	Negative	Nil	Lacerated ileum and mesentery	Resection 2 feet ileum. End to end anastomosis		Lived		
4.	Stab wound	Moderate	Not noted	6″ colon + small bowel	Ileal perforation	Suture ileal perforation. Omentum excised	Abscess abdominal wound	Lived		
5.	Stab wound	None	Not noted	Nil	Perforated ileum	Suture perforation ileum		Lived		
6.	Stab wound	Severe	Negative	Nil	Thoracico-abdominal 4 ilial perforations. Tear transverse colon	Suture ileal perforations. Repair transverse colon tear	Gross peritoneal soiling		Died	4 hours post-operatively
7.	Stab wound	Severe	Negative	Small gut	Tear mesentery. Perforation ileum	Suture ileum. Suture mesentery		Lived		
8.	Stab wound	Severe	Negative	Small gut	Perforated ileum	Suture ileum		Lived		
9.	Stab wound	Moderate	Negative	Small gut	Perforation ileum.	Suture ileum		Lived		
10.	Gun shot wound	Severe	Negative	Nil	Perforation jejunum 1½″ tear transverse colon	Resection jejunum. End to end suture. Transverse colon sutured Gross soiling	Overwhelming peritonitis		Died	8 hours post-operatively
11.	Gun shot wound	Severe	Negative	Nil	5 through and through perforations small gut	Suture multiple perforations and lacerated mesentery	Operation for small bowel. Obstruction 4 weeks later	Lived		
12.	Kick in abdomen	Severe	Negative	Nil	Laceration upper ileum	Suture ileal tear		Lived		
13.	Kick in abdomen	Moderate	Negative	Nil	Laceration jejunum	Suture small gut tear		Lived		
14.	Kick in abdomen	Moderate	Negative	Nil	2 tears ileum	Suture ileal tears	Peritonitis		Died	14 hours post-operatively
15.	Kick in abdomen	Moderate	Negative	Nil	2 perforations terminal ileum	Suture perforations		Lived		
16.	Kick in abdomen	Moderate	Negative	Nil	Mesentery tears. Ileum completely divided	8″ Resection. End to end. Removal ++ ascaris	Intestinal obstruction after 2 weeks. Adhesions	Lived		
17.	Kick in abdomen	Moderate	Negative	Nil	Torn ileum	Suture ileum		Lived		

TABLE VI: LARGE BOWEL INJURIES

Case	*Nature of Trauma*	*Shock*	*Sounds*	*Evisceration*	*Site of Injury*	*Operation Done*	*Complications*	*Lived*	*Died*	*Time of Death*
1.	Stab wound	None	Negative	Small gut	2 perforations caecum	Suture caecal perforations and mesentery		Lived		
2.	Stab wound	None	Negative	Omentum	Perforation sigmoid	Suture perforation sigmoid	No drain	Lived		
3.	Stab wound	Moderate	Negative	Nil	2 perforations transverse colon. Spleen	Suture transverse colon. Oxycel suture spleen	Peritonitis		Died	5th day
4.	Stab wound	Severe	Negative	Omentum	Perforation splenic flexure	Suture splenic flexure. Drain		Lived		
5.	Stab wound	Moderate	Negative	Omentum	Perforation ascending colon and jejunum	Suture ascending colon and jejunum. No drain	Pelvic abscess	Lived		
6.	Stab wound	Severe	Negative	Small gut	Laceration ascending colon	Exteriorization as a colostomy. Colostomy closed 5 weeks later		Lived		
7.	Gun shot wound	Moderate	Negative	Nil	4 perforations descending colon	Suture 4 perforations. No drain		Lived		

INJURIES TO THE COLON (TABLE VI)

Seven cases were treated, six of which resulted from stab wounds and one a gun-shot injury. There was one death occurring on the fifth post-operative day.

In six cases the perforations were closed by simple two-layer suture. Four of these had more than one perforation.

Exteriorization of the lacerated bowel as a colostomy was resorted to on one occasion only, the involved ascending colon being closed five weeks later.

Although the series is far too small to press the merits of definitive treatment, we would like to make a plea for the now much maligned 'simple suture' of large bowel injuries.

The hazards of this procedure have been repeatedly stressed and the underlying anatomical reasons for this apprehension are well recognized. Nevertheless we feel that many of these traumatic perforations are readily accessible and can be satisfactorily closed by suture without a proximal colostomy or caecostomy. The successful outcome is certainly aided by the free use of antibiotics, sulfasuccidine, penicillin and streptomycin.

Altmeier states that at the Cincinnati General Hospital large bowel injuries were treated, not with exteriorization but by suture with silk, with a low mortality.

The other extreme is adopted by Jarvis *et al.* who recommends that for caecal and ascending colon injuries, the wound should be converted into a caecostomy by suturing in a catheter and anchoring it to the deep fascia.

Furthermore they state that ilio-colostomy, with resection beyond the tear may be resorted to. For the remaining large bowel injuries they exteriorize as a spur colostomy, emphasing the necessity of a spur 5-6 inches long.

Undoubtedly when there is a retroperitoneal tear, or when there is much bruising, or when the laceration is so extensive that the blood supply to the suture line is jeopardized, then exteriorization of the affected bowel is the safest procedure. Wounds of the transverse and pelvic colon lend themselves easily to exteriorization but the remaining fixed portions require mobilization with concomitant shock and the resultant colostomy is all too frequently unsatisfactory and difficult to close.

INJURY TO THE KIDNEY

Four cases were admitted to the surgical wards—two as a result of blunt injuries and two due to stab wounds.

We have not included the numerous crush injuries with transient haematuria but only the two cases of crush injury in which exploration was undertaken. In both, the kidney was not found to be fragmented and conservative treatment was continued with good results.

In the two stab wounds affecting the kidney, these were found on exploration of wounds in the loin. Both were treated by simply placing a drain to the area and they both had uneventful recoveries.

PERINEUM AND URETHRA

There was one stab in the perineum with a partial severance of the urethra. Seven ruptured urethas, three associated with fractured pelves, were admitted during the period of review. All these seven were due to crush injuries. The majority of these cases were treated by the urology unit with suprapubic drainage, splinting the urethra with a catheter and in some cases suturing. These cases are mentioned for completion and the treatment is not within the scope of this paper.

MASSIVE BLUNT TRAUMA

Three cases occurred in this group, all were dealt with on the lines stated above. These were massive injuries caused by crushing and is well exemplified by a description of one of the patients. This patient (A8782) was admitted to our unit having been crushed between a

lorry and a bus, and sustained two fractured femura, completely shattered pelvis, a ruptured bladder, and intraperitoneal tear of the rectum, traumatic perforations of the ileum and tearing of the mesentery devitalizing 18 inches of small intestine. He was resuscitated and operated on, requiring a small bowel resection, a reconstruction of the bladder, a colostomy as well as a repair of his rectum. Both femora had to be put in extension. Unfortunately we lost him on the 18th post-operative day due to a delayed rupture of the ileum through a bruised devitalized area.

The other two cases were not quite so extensive, with one death and one recovery.

MORTALITY

The mortality associated with the lesions of the various viscera are discussed in their various groups and summarized in Table 7.

TABLE VII: MORTALITY

Injury to abdominal wall	Nil
Penetrating wounds	2·5%
Perforating wounds	21·8%
Penetrating and perforating wounds	13·7%

Billings and Walking (1931) reported 220 penetrating abdominal wounds and found in the operated cases a mortality of 48.2% in gun-shot wounds and 22% mortality in stab wounds. These cases were also civilian injuries.

Martin (1933) reported a mortality of 46.6% in 180 cases of penetrating wounds of the abdomen of which only 123 had perforations of a viscus.

Hamilton and Duncan (1944) reported a mortality of 48.9% in 182 cases of gun-shot wounds and 13.8% in 145 abdominal stab wounds. Shock and infection were responsible for the majority of deaths.

Sloan (1944) in a small series divides his cases into two:—

	1925-1938		1939-1943	
	%	*Cases*	%	*Cases*
Stab wounds	25·8	31	4·2	24
Gun shot wounds ..	33·9	56	14·3	34

and attributes his improvement to the use of antibiotics.

Innes (1945) found that the mortality of any abdominal wound was much higher where more than one viscus was damaged.

It can be seen from these figures that the mortality has gradually become less. The main reasons for this are:

1. Better shock therapy.
2. Better anaesthesia.

We have found posterior intercostal and lower abdominal nerve block, using anethocaine hydrochloride 1 : 1,000 together with posterior splanchnic block (anethocaine 1 : 3,000) to be an admirable anaesthetic for these cases.

3. Careful post-operative management.

(*a*) The routine use of continuous intestinal suction until peristalsis is heard. This occurs usually on about the third or fourth day.

(*b*) Maintenance of fluid balance and careful watch on urinary chlorides as well as the urinary output.

(*c*) The use of antibiotics.

SUMMARY

1. One hundred and forty-five cases of abdominal trauma are presented.

2. The diagnosis of intraperitoneal lesions is discussed.

3. Lesions of the various viscera are detailed and their treatment given.

We wish to thank the Heads of other Surgical Units at Baragwanath Hospital for the use of their cases in this series.

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ASSOCIATION NEWS : VERENIGINGSNUUS

NATAL COASTAL BRANCH

MINUTES OF A CLINICAL MEETING HELD AT THE KING EDWARD VIII HOSPITAL, CONGELLA, ON 15 MARCH 1950

Present: Dr. H. Renton (President) in the chair and some 80 members and guests.

A. DEMONSTRATION OF CASES

1. *A Survey of Nutritional Oedema at King Edward VIII Hospital,* by Dr. Pauline Klenerman.

In the very limited time at her disposal Dr. Klenerman gave a thorough yet concise account of this grave problem which is associated with such a high mortality rate. She detailed the clinical and pathological features with special mention of deficiencies in specific vitamins. Reference was made to the reports of other workers and of her discussions with paediatricians on a recent visit to the U.S.A. She showed how the cases had been fully investigated and indicated the lines of treatment which she had found to give the best results. She concluded her address by stressing that this was a national problem of such magnitude that it was a matter for the Union Government. Every means, she said, should be employed to educate the Bantu peoples to a better knowledge of the essential factors of a healthy diet, and to urge that the problem be tackled vigorously. She concluded with the words 'let us march forward with our slogan: Prevention is

better than Treatment'. Dr. Klenerman was accorded a very hearty appreciation.

Drs. E. P. Walt, J. Drummond, J. Friedlander, A. H. Lasbrey and J. K. Drummond took part in the discussion.

2. (a) *Macrocytic Anaemia* by Dr. E. B. Adams. Megaloblastic anaemia illustrated by two cases in Indians. Drs. Hendrickse and Lasbrey discussed the cases.

(b) *Rheumatoid Arthritis.* Dr. N. A. Rossiter showed young adult Indian females with this disease and referred to the treatment by cortisone or D.O.C.A. plus intravenous vitamin C. Drs. Friedlander, B. Morris and J. Drummond contributed to the discussion. Dr. Drummond mentioned that he had found testosterone or progesterone plus vitamin C most useful and that vitamin K and a synthetic anti-histamine would control the allergic factor.

3. *Plantar Warts.* Dr. A. D. Smit exhibited the condition in a middle-aged African male who until 1946 had received almost every known form of treatment—X-rays, diathermy, excision and caustic applications. The soles of the feet were now much scarred and contracted and very painful to the touch, so that he was only able to walk with the aid of pattens and a stick. Dr. Smit welcomed advice about further treatment.

Drs. Fleming, Gillwald, Fine, Ingle, B. Morris, Bell, Andrews and J. Drummond took part in a free discussion dealing with formalin soaks, the application, Podophyllin resin and of pure carbolic plus fuming nitric acid, simple excision, bismuth injections (both intramuscularly and into the bases of the warts), and X-ray dosage.

4. *A Case of Plexiform Neuroma* by Dr. Kelman Drummond.

The patient was an African Female aged 12, having a large rather soft swelling over the occiput with a rounded deficiency in the underlying skull. The girl had come to hospital complaining of failing vision which examination had shown to be due to a high degree of myopia.

There were cutaneous nodules on the trunk and limbs which on section were shown to be neurofibromatous and the scalp tumour a plexiform neuroma.

The 'hole' in the skull had proved a puzzling feature, but it seemed to have no relation to the neuroma and was probably due to a xanthoma (Hand-Schüller-Christian disease of bones).

Drs. Gillwald, English, Boyes and Thompson took part in the discussion.

5. *A Case of Chondrosarcoma of the Scapula* by Dr. N. M. Thompson.

This was in an African female and formed a large tumour over the right scapula. The diagnosis had been confirmed by histological section, its size considerably reduced by X-radiotherapy and, since she had refused a fore-quarter amputation, only the scapula and clavicle had been excised. Muscular power and movements at the elbow and wrist were good, but the orthopaedic problem was to stabilize the head of the humerus by means of an operation plus an appliance or by an appliance alone. The prognosis as regards the occurrence of secondary deposits was very guarded.

6. *A Case of Melorheostosis* by Dr. G. H. Andrews.

This condition is rare, only some 50 cases having been recorded, and is also known as 'the Léri' type of osteopetrosis and the essential features are a scleroderma with periosteal fibrosis resembling the flow of candle-grease down the limb. Usually the lower limb is affected, but occasionally the upper limb.

The disease was demonstrated in an Indian female aged 10 years with thickening of the skin over the inner aspect of the right thigh and leg, flexion contracture and labral bowing at the knee, and the hard fibrous band along the sartorius muscle.

The etiology was not known, but probably was a developmental error. The treatment was orthopaedic. *Dr. N. M. Thompson* discussed this case.

B. SHORT CASES FOR DEMONSTRATION ONLY, ON VIEW BEFORE THE MEETING

1. A case of brain tumour.
2. Congenital synostosis of carpus and tarsus.
3. Mitral stenosis plus aortic regurgitation exhibiting 'pistol shot' sounds in the groins.
4. Mitral stenosis plus thrill over the cardiac apex.
5. Mitral stenosis plus aortic incompetence.
6. Knife blade removed from the floor of the right anterior fossa.

The President expressed the sincere thanks of the Branch and the meeting to the Medical Superintendent and Medical Staff for arranging the demonstrations and also to those responsible for the generous refreshments. The meeting closed at 10.45 p.m.

MINUTES OF A CLINICAL MEETING HELD IN THE CITY HALL ON 25 APRIL 1950

Present: Dr. H. A. Renton (President) in the chair and approximately 80 members and guests.

The subject, *Thrombotic Disease, Coronary and Peripheral*, took the form of a Symposium. Dr. Basil Sampson, Mr. Arthur Copley, Mr. Bryan Murless, Dr. B. Moshal and Dr. Kelman Drummond opened the discussion from different aspects. Each of these speakers was limited to 10-15 minutes.

Dr. Sampson dealt with the pathology of thrombus formation and said there were two main factors involved: (a) Haemorrhage from a subintimal sinusoidal capillary associated with atheroma of the vessel; (b) increase in the circulating thromboplastin which occurred after an operation (trauma) or in the ageing in whom there was an increase in the number of platelets. These were fragile and in breaking down liberated thromboplastin. The heparin tolerance test would give an indication of this. The prothrombin test of relative prothrombin activity was also used.

Dicumarol, he remarked, did not act rapidly and because of slow excretion tended to be cumulative and he warned his audience to pay attention to the contra-indications to its use, some of which he mentioned.

He said that a new drug B.O.E.A. (which was much safer) probably would soon be available to replace Dicumarol. He also said that erythrocytes could often be found in the urine before a haemorrhage took place and this test could be employed in the control of the dosage of Dicumarol.

Mr. Copley dealt with thrombosis in the leg veins which detracted from the success of surgery. He mentioned the physiological factors influencing thrombosis and especially venous stasis which resulted from recumbency and the associated idle diaphragm; also tissue trauma which acted from the second to sixth day post-operatively. Thrombosis appeared to be more frequent after pelvic operations, possibly due to more trauma. The liver was chiefly involved as there was very little risk of thrombosis with a jaundice. He said that if the beta globulin of the blood was raised then that patient was a potential thrombotic.

Mr. Copley dealt briefly with the treatment of the condition, e.g. early post-operative breathing despite pain and early ambulation. He said that deep venous thrombosis was liable to develop in a limb encased in plaster of Paris and that heparin and dicumarol were especially safe if phlebitis was present in a limb, but that there was no antidote to dicumarol except blood transfusion.

Mr. B. Murless considered thrombosis from the gynaecological angle, particularly white leg. He said the cause of the clinical picture in a fully developed case was not definitely known, but arterial spasm could produce a similar picture and therefore white leg could be treated by sympathetic block of the lumbar ganglia with novocaine. This procedure enabled a patient to get up within a week or so and the late complications of callous oedema, ulceration and pigmentation of the skin could be avoided.

In bilateral white leg the systemic upset could be considerable and was due to dehydration which could be controlled by appropriate intravenous infusion. As regards post-operative thrombosis being more common after pelvic operations, it was to be remembered that most of these patients were between 45 and 70 years of age, i.e. were more liable to clot than younger persons. In spite of advancing knowledge, the incidence of post-operative thrombosis had hardly improved within the last 15-20 years. Probably this condition commenced in the superficial posterior calf veins and therefore pre-operative exercises and massage and early post-operative ambulation were indicated, but he thought this last could be overdone. He considered the traditional Fowler's position a menace as it flattened the femoral veins as they entered the pelvis.

He remarked that anticoagulants only stopped fresh clot formation and that the indications for ligation of the superficial femoral vein were not clear.

Clotting could be avoided by not operating, e.g. instead of hysterectomy an artificial menopause could be produced by X-radiotherapy and that no patient has died of a prolapse.

Dr. B. Moshal was concerned with the treatment of coronary thrombosis with anti-coagulants. He said that there was considerable weight of authoritative opinion against their use, but that in the U.S.A., which had the largest experience, the evidence was definitely in favour of their use. He said the chief difficulties in giving these drugs was their high cost, e.g. heparin from £2 to £4 daily. Dicumarol was relatively cheaper and was given orally, but was dangerous unless daily prothrombin time estimations could be carried out; if the level was maintained at 10-30% it was safe. He considered that vitamin K was useless for haemorrhage and that anti-coagulants should not be given to a patient in his home as there was no laboratory service available. If no such service was available he advised rest, sedation and symptomatic treatment.

Dr. K. Drummond demonstrated the E.C.G. changes which occurred in coronary thrombosis, i.e. myocardial infarction. He mentioned recent advances in cardiography and said that the standard three leads did not give a very reliable indication of infarction, sometimes indicating no infarction where one was present and, worse still, indicating one where none existed.

Dr. Drummond showed with the aid of diagrams on a blackboard, what changes in the tracings may be expected when the indifferent electrode was attached to a limb and an exploring electrode passed across the chest. He said that multiple leads and an exploring electrode were essential for accurate diagnosis.

DISCUSSION

Dr. L. Walker mentioned the difference between the two tests (1) Prothrombin time and (2) Prothrombin concentration which was not very reliable.

Dr. F. Stern asked what were the contra-indications to anti-coagulant therapy. Reply: liver and renal disease, haemorrhagic diathesis, bleeding ulcers, etc.

Mr. I. Goldberg said that in white leg the spasm in the arterial system was out of proportion to the size of the clot, and that a small clot in a calf vein might cause considerable spasm and might be excised with relief of the spasm. He did not advise paravertebral block with anti-coagulant therapy as a large paravertebral haematoma might form.

Dr. J. Friedlander wished to know whether it was good to give gynaecological cases pre-operative anti-coagulants. Mr. Murless replied that they would be likely to increase the danger of haemorrhage.

Dr. M. S. Miller enquired whether there was any means of gauging the cumulation of Dicumarol. He said that massive doses of vitamin K had been reported as being effective in preventing haemorrhage. Dr. Moshal replied it was impossible to control the action of Dicumarol.

Dr. Sampson said that vitamin K was antagonized by Cumarin in the blood.

Dr. J. Drummond congratulated all the speakers and asked why the sub-intimal capillary ruptured since if this were known it might be possible to avert thrombosis. Was this an allergic manifestation and was capillary fragility present in such a state, he queried. Therefore, he said, do a fragility test. He also wished to know what was the prothrombin blood level in pre-thrombotic states.

Dr. Sampson replied that thromboplastin in the blood was raised in impending thrombosis.

Dr. E. B. Adams stated it was known that haematemesis may be due to allergy to aspirin and that Dicumarol was broken down into salicylate. He said that a writer in the *B.M.J.* had treated, with success, the pain in coronary thrombosis with massive doses of Aspirin.

Dr. A. Bloom remarked that coronary thrombosis or angina pectoris was much more common to-day than 50 odd years ago, and that atheroma was known to Hippocrates, but was probably not more common to-day. Therefore there must be other factors in modern methods of living responsible for this increase: the medical profession showed the highest percentage of thrombosis.

Dr. M. Berkowitz mentioned the use of Rutin to decrease capillary permeability. He asked if vitamin deficiency was present in the doctor and not in the Native.

Dr. D. S. Mall spoke of a possible psychogenic cause for coronary thrombosis, haematemesis, etc., and said that mental strain was higher in medical practitioners than in Africans.

The President warmly thanked all the speakers for a most interesting and instructive evening.

The meeting closed at 10 p.m. after which refreshments were served.

SOUTHERN TRANSVAAL BRANCH

INTRAVENOUS PROCAINE *

The speaker stated that the total knowledge on the subject was infinitesimal when compared with what still had to be done, but the successes achieved with procaine indicated that there was a wide scope of useful application for this drug in many branches of medical science.

If procaine were administered for effect, in accord with the signs and symptoms, it could be administered in as exact and scientific a manner as was done with other anaesthetic agents, the smooth progress of anaesthesia being dependent on being conversant with and correctly interpreting and assessing the signs and symptoms observed.

The Signs and Symptoms. They were found to be fairly constant and a classification was thus possible, two groups of signs and symptoms being described.

The first group consisted of those which occurred during uneventful anaesthesia. The second group consisted of those signs and symptoms which indicated sensitivity and patients could be placed into one of five degrees of sensitivity by an observation of the time of occurrence of the signs and symptoms of sensitivity in relation to the signs and symptoms of uneventful anaesthesia.

As a marked variation in dosage in the production of identical signs and symptoms in different patients was also a feature of intravenous procaine, it was shown that four extremes of reaction were possible.

The effects of increases or decreases in basal metabolic rate were dealt with and after an outline had been given of the signs and symptoms the after-effects were described and the term 'residua' as applied to the residual effects of procaine was defined. The effect of the barbiturates having been duly dealt with, the convulsion was described and it was shown how convulsions could be avoided by a process termed desensitization by repeated mild stimulation, or, more rapidly and effectively, by the short-acting barbiturates.

The Use in Surgery. A few of the many operative procedures in which procaine had been used by the speaker were mentioned, viz., tonsillectomy, appendicectomy, thyroidectomy, myomectomy, hysterectomy, laparotomy, umbilical and inguinal herniorrhaphies, plating of fractured femur, etc. and, in the conscious patient, dental clearance, wiring of fractured jaw and extraction of teeth, urethral dilatation, excision of tumour, repair of large laceration, burn cases, etc. Intravenous procaine was already well-known as an adjunct in anaesthesia and the speaker's work had shown that it could be used as a general anaesthetic with what seemed to be a reasonable degree of safety. Although its exact field of application as an anaesthetic had still to be determined, the indications were that although its use did not appear to be indicated in some operations it would probably be of value in others.

Obstetrics. An outline was given of the effects observed, in the speaker's experience, no injury or after effects having been observed in either the mother or child. There also appeared to have been no interference with the course of labour, and this section was concluded with the observation that as there was a rapid and flexible control of administration during which analgesia was quickly induced and controlled, pain having been relieved in an effective and prolonged manner without loss of consciousness, intravenous procaine commended itself for further study in the field of obstetrical analgesia.

Therapeutics. The various actions of procaine were briefly

* Synopsis of an address given by Dr. O. Schmahmann at a recent mee'ing of the Southern Transvaal Branch of the Medical Association of South Africa.

outlined and it was shown how Speransky's theories, which expounded new concepts in medicine, dove-tailed and complied with the clinical assessment of the cases in which the speaker had used procaine for therapeusis.

The rule was laid down that if discredit were not to be brought on a valuable drug, intravenous procaine should be administered only:—

(a) When it was believed, or when experience had shown that the condition productive of the symptoms would be favourably influenced by the procaine; or

(b) When the use of procaine would aid the recovery or assist in the well-being of the patient.

Although there were a good many conditions which could have been described, time permitted only one to be partially dealt with, viz. the effect of intravenous procaine on pain. This was thus briefly discussed and as an illustration its use in arthritis was briefly described, it being shown how the effects observed complied with the theories expounded and two dramatic cases of recovery following the use of intravenous procaine were briefly outlined as examples of what could be achieved.

Migraine. Two examples were given of the effects of intravenous procaine in migraine, and a new method of treatment for migraine was thus presented. Both cases were colleagues who had been having migraine frequently (four or five times a month). After procaine administration there had been no recurrence of the migraine attacks, one patient having been free of symptoms for 18 months, and the other for seven months.

The Administration. The cutaneous sensitivity test was found to be of no value in determining the degree of sensitivity to intravenous injection and an intravenous sensitivity test was evolved which determined with reasonable accuracy not only the type of sensitivity present, but also the reactions which could be expected with intravenous procaine. This test was described.

The solutions which had been used were described, preference being given to a 1% solution.

The technique in surgery, obstetrics and therapeusis was described and it was emphasized that the technique was essentially intermittent. In surgical and obstetrical usage, a large volume (2 c.c. per second) was used for periods as indicated. It was shown that in its therapeutic use the technique used was a technique for effect, the procedure of administering procaine at a fixed dosage per fixed unit of time or of administering a fixed dosage per pound or kilogram of body weight not being a procedure that commended itself.

Conclusion. That accidental administration of procaine was viewed with dread until a few years ago was well understandable, but with a knowledge of the signs, symptoms and effects, and with a method of avoiding untoward effects, such as convulsions, etc., many of the fears now associated with the use of procaine could be removed.

The speaker envisaged an ever-widening usage and appreciation of the effects produced by the drug, but stressed that it was not a panacea for all ills, and that all cases did not respond to treatment. He pointed out, however, that even if only one-tenth had responded, the results obtained would still have been gratifying, and that alone warranted its continued investigation and use.

He concluded with the statement that procaine should only be used when indicated, used with understanding and an appreciation of its capabilities and limitations.

PASSING EVENTS

Dr. I. R. Ross of Umtata has just returned to South Africa after doing post-graduate work overseas. Dr. Ross has recently qualified for admission to the Fellowship of the Royal College of Surgeons, Edinburgh and will now resume practice in Umtata.

B.M.A. Conference and Exhibition: July 1950

For the occasion of the visit to The Evans Biological Institute on Thursday, 20 July during the B.M.A. Congress, a scientific conversazione is being held in the Institute. Special demonstrations and displays will be arranged in practically every department of techniques and developments in the preparation, standardisation and control of medical, veterinary and pharmaceutical products.

Visitors will be at liberty to wander round at will as there will be no organised parties. Interpreters will be available and every effort is being made to show the important part being played by Evans in the pharmaceutical industry to-day.

Arrangements are being made to deal with a party of well over 200 doctors so that there will be ample room for all overseas doctors intending to join the visit.

Evans' stand at the exhibition is adjoining the registration counter which will enable them to assist overseas doctors in regard to the visit to The Evans Biological Institute.

* * * *

The marriage of Dr. Julius H. Kretzmar of Kimberley, Honorary Secretary of the Griqualand West Branch of the South African Medical Association, to Miss Althea Katz of Durban will take place in the St. Andrew's Road Synagogue, Durban, on Sunday, 25 June 1950 at 4 p.m.

OFFICIAL ANNOUNCEMENT

Publication of Names of Medical Practitioners

The Executive Committee of Federal Council is of the opinion that the publication of names of medical practitioners in a classified business Directory, for which a fee has to be paid, is a form of advertising or, at least, is undesirable.

Members of the Association are advised against allowing their names to appear in any such Directory.

Medical House,
35, Wale Street,
Cape Town.
30 May 1950.

A. Simpson Wells,
Honorary Acting Medical Secretary.

AMPTELIKE AANKONDIGING

Publikasie van Name van Mediese Praktisyns

Die Uitvoerende Komitee van die Federale Raad is die mening toegedaan dat die publikasie van name van mediese praktisyns in 'n klassifiseerde adresboek, waarvoor betaling moet geskied, 'n vorm van advertensie is of, tenminste, dat dit ongewens is.

Lede van die Vereniging word aangeraai om nie hul name in enige dergelike adresboek te laat verskyn nie.

Mediese Huis,
Waalstraat 35,
Kaapstad.
30 Mei 1950.

A. Simpson Wells,
Ere Waarnemende Mediese Sekretaris.

REVIEWS OF BOOKS

Pocket Prescriber

The Pocket Prescriber and Guide to Prescription Writing. By D. M. Macdonald, M.D., D.P.H., F.R.C.P.E. Revised by A. G. Cruikshank, F.R.C.P.E. (Pp. 275 + xv. 4s. 6d.) Edinburgh: E. & S. Livingstone Limited. 14th ed. 1949.

Contents: 1. Preface. 2. Foreword. 3. Introduction. 4. Some Points in Practice. 5. Some Points in Prescribing. 6. Incompatibilities. 7. Synonyms for Drugs and Medical Preparations. 8. Index to Prescriptions. 9. Prescriptions for various diseases. 10. Diets. 11. Selected National Formulae. 12. Some Modern Remedies. 13. Administration of Sulphonamides. 14. Penicillin. 15. Posological Tables for Adults and Children. 16. Enemata. 17. Vitamins. 18. Average Body Weights. 19. Incubation Periods. 20. Poisoning: Emergency Antidote Case. 21. D.D.A. Regulations. 22. Appendix. 23. Equivalents of English Weights to Grammes. 24. Equivalent Measures of Capacity. 25. Table of Strength of Solution. 26. Methods for Converting Grains into Grammes and *vice versa*. 27. Numerals commonly used in Prescriptions. 28. Table of Quantities. 29. Abbreviations. 30. Proprietary Preparations. 31. B.P. 1948 and B.P.C.: New Monographs.

Those who want to know about prescriptions will find examples in this well-known vest-pocket book for practically every condition met in practice. In addition there are notes on official and proprietary drugs, synonyms, doses for children, B.P. 1948 preparations, and other useful information.

SYNOPSIS OF PHYSIOLOGY

A Synopsis of Physiology. By A. Rendle Short, B.Sc., M.D., F.R.C.S., C. L. G. Pratt, *O.B.E.*, M.A., M.D., M.Sc., C.C.N. Vass, M.Sc., Ph.D., M.B., Ch.B. (Pp. 346. With 23 illustrations. 20s.) Bristol: John Wright & Sons Ltd. 4th ed. 1948.

Contents: 1. Chemistry. 2. Blood, Lymph and Cerebrospinal Fluid. 3. The Heart. 4. The Circulation. 5. The Respiratory System. 6. Voice. 7. Movements of the Alimentary Canal. 8. The Digestive System. 9. The Endocrine Glands. 10. The Spleen. 11. The Kidney and Excretion of Urine. 12. Metabolism. 13. Diet and Growth. 14. The Liver. 15. Bone. 16. Skin, Body Temperature. 17. Muscle. 18. Nerve. 19. The Spinal Cord. 20. The Brain. 21. Autonomic Nervous System. 22. Smell and Taste. 23. Hearing. 24. Sight. 25. Cutaneous, Muscular and Visceral Sensation. 26. Reproduction.

The aim of this book is 'to give a fairly full summary of modern physiology, particularly human physiology. The beginner should consult also an ordinary textbook ... but should be able with the aid of this synopsis to extend his knowledge or revise it with a minimum of expenditure of time and trouble. Practitioners who wish to keep abreast of modern physiology will find here a means of making a quick survey'.

Of such a book as this we require an accurate statement of facts marshalled in such a way that they are easy to find, their relative importance easy to assess and tell enough of the truth to be of practical use. If a book of this nature fails to present the subject-matter in its true perspective, it does more harm than good.

On the whole the authors have succeeded in their most dangerous task. The book is very competently written, with a very complete index. Such errors as it contains do not greatly detract from the general value of the book. The section on the nervous system is particularly clear. It is a pleasure, in a condensed work of this type, to see conflicting views presented with the evidence on which they depend.

ORTHOPAEDIC SURGERY

A Practice of Orthopaedic Surgery. By T. P. McMurray, *C.B.E.*, M.B., M.Ch., F.R.C.S. (Pp. 444 + viii. With 191 illustrations. 3rd ed. 30s.) London: Edward Arnold & Co. 1949.

Contents: 1. Orthopaedic Surgery. 2. Splints and Apparatus. 3. Rigidity of Joints. 4. Disabilities of the Knee-Joint. 5. Injuries to the Shoulder-Joint. 6. Tuberculous Affections of Bones and Joints. 7. Tuberculosis of the Hip-Joint. 8. Tuberculosis of the Knee, Ankle and Tarsus. 9. Tuberculosis of the Spine and Sacro-Iliac Joint. 10. Tuberculosis of the Shoulder, Elbow and Wrist. 11. Chronic Arthritis. 12. Epiphyseal Affections. 13. Non-Tuberculous Affections of the Spine. 14. Lateral Curvature of the Spine. 15. Acquired Deformities. 16. The Foot. 17. Acute Anterior Poliomyelitis. 18. Spastic Paralysis (Cerebral Paralysis of Children). 19. Peripheral Nerve Injuries. 20. Affections of Muscles and Tendons. 21. Congenital Dislocation of the Hip and Other Congenital Dislocations. 22. Congenital Deformities. 23. Rickets. 24. General Affections of Bone. 25. Tumours of Bone. Index.

The recent death of the author has brought into bold relief the teaching of his lifetime. He pioneered the post-graduate teaching of orthopaedic surgery in Liverpool. This book is essentially a condensation of the conservative teaching of the Liverpool School in the tradition of H. O. Thomas and Sir Robert Jones.

The author was a brilliant clinician and this book brings that clear, kindly and tolerant voice of the past echoing from the Out-Patient Department of the Northern Hospital in Liverpool. The book is short and practical and should be read in conjunction with clinical work and experience. Emphasis has been laid on diagnosis and treatment, rather than on pathology, in order to keep the size of the book within reasonable bounds; for this reason also, fractures have been excluded.

To the student the chapter on the rigidity of joints may be confusing and will only become clear with clinical experience and clinical teaching. This is not a book of reference but a practical guide to orthopaedics and as such is useful to undergraduate and postgraduate alike.

THE NASAL SINUSES

Your Nasal Sinuses and Their Disorders. By Albert P. Seltzer, M.D., M.Sc., Sc.D. (Med.), F.A.C.S., F.I.C.S. Pp. 155. Illustrated. $2.50) New York: Froben Press, Incorporated. 1949.

Contents: 1. Introduction. 2. The Nose: The Entryway to the Sinuses. 3. The Early Evolution of the Nose and Its Prenatal Development in Man. 4. How the Nose Plays its Part. 5. The Sinuses: What They Are. 6. The Sinuses: Their Uses. 7. The Sinuses: Evolution and Prenatal Development. 8. What is Sinus Trouble and Why? 9. What is Your Complaint? 10. It may not be Sinus Trouble. 11. It may be Your Emotions. 12. Sinus Disease in Children. 13. Sinus Disorders in Relation to the Nearby Parts. 14. Do's and Dont's in Sinus Trouble. 15. Where the Doctor Enters the Scene. 16. When all is Said and Done.

Written primarily for the man-in-the-street, this book presents the subject in the unstated order of anatomy, physiology, etiology, diagnosis and prevention.

Each of the first three sections is followed by its series of excellent illustrative diagrams and pictures, those depicting etiology being particularly illuminating, with some possessing the charm and force of the cartoon.

The author clearly correlates the onset of the sinus disorder with the mode of action of the causative factors, either as they disturb nasal physiology (allergy; emotions; a warm, stuffy atmosphere) lower general health (anaemia; avitaminosis, particularly in children), act mechanically (incorrect forceful nose-blowing; swimming) or arise anatomically (an infected contiguous tooth).

The statement 'there are no typical symptoms of sinus trouble' is clinically sound and since the disease may exist, treacherously, in the absence of local symptoms, its exclusion or discovery demands competent investigation by all ancillary means.

The frequency of sinusitis in childhood is stressed, and its consideration in 'the chronic ear' strongly advised.

The '*do's* and *don'ts* in sinus trouble' comprise a sound practical guide to its prevention. A *don't* about excessive sunbathing could advantageously be added to the list.

Excellent illustrations enrich this straightforward and simple exposition of a daily medical problem and bring the book within the orbit of the busy, interested practitioner.

IRON METABOLISM: CLINICAL SIGNIFICANCE

Iron Metabolism and its Clinical Significance. By A. Vannotti, M.D., and A. Delachaux, M.D. Translated by Erwin Pulay, M.D. (Pp. 267 32s.) London: Frederick Muller Ltd. 1949.

Contents: Part I. The Biological Significance and Normal Metabolism of Iron. 1. General Biological Considerations Regarding the Physico-chemical properties of Iron. 2. The Metabolism of Iron. 3. The Biological Significance of Iron. 4. The Circulating Iron. 5. Considerations Regarding the Physiology of Non-Haemoglobin Iron.
Part II. Iron Metabolism under Pathological Conditions. 6. Iron and Blood Changes. 7. Iron and the Reticulo-endothelial system. 8. Iron Metabolism in Lead Poisoning. 9. Iron and the Hyperfunction of the Bone Marrow. 10. Iron in Hepatic Diseases. 11. Iron and General Metabolic Disturbances. 12. General Conclusions. *Part III. Clinical Indications and Practical Considerations in Iron Therapy.* 13. The Most Important Iron Preparations. 14. The Use of Iron Therapy. 15. Contra-Indications of Iron Treatment. 16. The Doses and Duration of Iron Therapy. 17. Bibliography. 18. Subject Index. 19. Author Index.

This book deals exhaustively with the metabolism of iron from its absorption to its excretion, in health and disease. In the first part, normal metabolism is discussed, including the rôle of iron as growth factor, catalyst for tissue respiration and essential constituent of haemoglobin. Special consideration is given to the non-haemoglobin iron of the serum and the authors have been personally engaged in research into this problem. The significance of four fractions of the serum iron is elaborated and the techniques and results of various workers in this field are correlated. The use of radio-active iron has thrown much light on problems of iron metabolism and this also is discussed.

The second part deals with iron metabolism in disease, as, for example, in blood diseases, diseases of the reticulo-endothelial system, hepatic disease, lead poisoning and myxoedema. Again, special emphasis is placed on the significance of the non-haemoglobin iron in these conditions. Indeed, the authors classify anaemias into two big groups, those in which there is a serum iron deficiency and those in which the serum iron is normal or increased. While this is hardly a practical classification, it is useful for an elaboration of their ideas. Their very interesting conception of tissue anaemia as opposed to anaemia due to haemoglobin deficiency (these two usually, though not always, occurring together) is discussed.

The third part is devoted chiefly to iron therapy and reference is made to the relative merits of ferrous and ferric iron. Intravenous iron therapy is fully dealt with and the last consideration is specially useful at a time when intravenous iron is being used widely and somewhat indiscriminately.

This is not an easy book to read and the translation is sometimes clumsy. It will appeal more to the research worker than to the clinician, to whom the complexity of the subject is increased by the mass of technical detail presented. One would have welcomed conclusions and summaries being more clearly stated. There is a full bibliography of Continental, American and British literature. Surprisingly, however, no reference is made to Sheldon's monograph on haemochromatosis nor to work on Cooley's anaemia. Far more important than these criticisms is the fact that the book contains much precise and detailed information about iron metabolism, together with carefully stated theory and speculation, and as such is most valuable.

Life Assurance Examinations

The Conduct of Life Assurance Examinations. By E. M. Brockbank, *M.B.E.*, M.D. Vict., F.R.C.P. (Pp. 176. 3rd ed. 12s. 6d.) London: H. K. Lewis & Company. 1949.

Contents: 1. Life assurance. 2. Proposal forms and reports. 3. Medical reports. 4. Family history. 5. Personal history. 6. Routine medical examination. 7. The blood pressure. 8. The cardio-vascular system. 9. The respiratory system. 10. The abdominal organs. 11. The nervous system. 12. The urinary system. 13. Examination of women. 14. Expectation of life. 15. Height and weight. 16. Alteration in blood pressure. 17. The cardio-vascular system. 18. The respiratory system. 19. The alimentary system. 20. The genito-urinary system. 21. The nervous system. 22. Tuberculosis risks. 23. Malignant disease. 24. Venereal disease. 25. Women. 26. Policies for hot climates.

No one will quarrel with the statement, contained in the preface to the third edition of this admirable little book, that 'the call for a new edition of this work within a year of the publication of its predecessor is an indication that it has been of use to those for whom it was intended'. Nor will any one doubt that it will continue to be of real assistance and use to the many medical practitioners called upon to conduct life assurance examinations.

Practical experience is worth more than theoretical discussion. Into this little book has gone the practical experience of one who has acted for over 60 life assurance companies, and has examined some 15,000 persons—'adolescent boys and girls, adult women and men, septuagenarians even'. He can be accepted as a sure and safe guide.

The correct routine to be followed when conducting examinations for life assurance is clearly, yet briefly detailed. The wise examiner adheres to a fairly well-defined routine in his examinations. This ensures a complete examination and avoids the danger of overlooking some point or other. The medical practitioner who has not had a great deal of experience of this type of work might, with advantage, pattern his routine on that described in this book.

Not the least valuable part of this book is the discussion it contains on the 'legal' and 'ethical' duties of the medical practitioner towards both the assurance company and the person examined. The author refers to the examiner as performing a 'judicial function' and stresses the necessity of 'holding a very even balance between the company and the proposer'.

There is some interesting information on the various forms of assurance and pension schemes, while the chapters dealing with the principles which influence the companies in deciding on the value of a proposal which has some defect of sufficient importance to affect the prospect of life, should be instructive to the examiner when forming his own opinion.

Altogether, this is a useful and a valuable little book.

The Child's Eye

A Child's Eyes. By Richard G. Scobee, B.A., M.D., F.A.C.S. (Pp. 109. With 19 illustrations. 14s.) St. Louis: The C. V. Mosby Co. 1949.

Contents: 1. The Effect of Crossed Eyes on the Personality. 2. Questions This Book Answers. 3. The Teamwork of Two Eyes. 4. Baby's Eyes. 5. Why Eyes Cross. 6. The Bad Effects of Crossed Eyes. 7. Glasses in the Treatment of Crossed Eyes. 8. Treatment of the Blindness of Disuse. 9. Eye Exercises. 10. Operations in the Treatment of Crossed Eyes. 11. The Treatment of Crossed Eyes after an Operation . 12. The Age to begin Treatment of Crossed Eyes.

This book has been written primarly for parents so that they can co-operate in the treatment of their children. The many questions every parent wishes to ask about these distressing squints are answered here.

It is a useful booklet to which to refer anxious parents. It gives a clear and concise explanation of the normal functioning of the human eye from birth onwards and is amply illustrated with diagrams to achieve that end. With an intelligent understanding of what has gone wrong and why, it is possible for parents, teachers, psychologists and others handling the child to cope with his particular defect, ensure that he receives treatment at the correct stage and help him in his daily problems.

The reasons for the appearance of crossed eyes in a young child, whether present at birth or noticeable only at a later date are given, and the possible effects of this defect on the normal functional development of the eyes and on the psychology of the child are other aspects fully discussed.

General practitioners and others not engaged daily in the specialized treatment of this type of case may find this short book of use in the modern views of treatment of this condition as both the methods of treatment employed and the age at which to institute them are discussed.

Spectacle Fitting

Spectacle Fitting and Optical Dispensing. By L. S. Sasieni. (Pp. 294, with 241 illustrations. 30s.) London: Hammond, Hammond & Co., Ltd. 1950.

Contents: 1. Materials and Types of Frames. 2. Frame Rules. 3. Frame Measurements. 4. Face Rules. 5. Face Measurements. 6. The Selection of Suitable Styles and Eye-shapes. 7. Special Purpose Frames. 8. Verification, Final Fitting and Adjustment. 9. Concerning Lenses. 10. Ordering. 11. General Considerations. Appendices I and II. Index.

This book, though primarily intended for the use of the optician, should prove interesting reading to the ophthalmologist who wishes to know what happens to his prescription, once his patient has taken it out of his consulting room. It is quite surprising to see the enormous range of types of spectacle frames and eyeshades available; and as a result of this wideness of choice with which the optician has to play, it becomes evident why we see so many people wearing patently unsuitable glasses, unsuitalbe in the sense of not being appropriate to the facial structure, or accentuating prominent or asymmetrical features.

On the other hand we have the question of the fitting of the spectacles, so that they are comfortable and secure. There is much on this topic which the optician could study with advantage. The author appears to be a leading constructor of different types of rules, many of which are quite unfamiliar (to the ophthalmologist); and these indicate that the taking of the P.D. does not, on its own, give sufficient data for the fitting of the spectacles.

The general impression given by this book is that there is a considerable science in the fitting of glasses, as compared with the casual, hit-or-miss method adopted by the general run of opticians, certainly outside the big centres.

CORRESPONDENCE

TREATMENT BY MEDICAL APPLIANCE SUPPLIERS

To the Editor: The profession in Johannesburg has recently been circularized by certain pharmacists, medical appliance suppliers, and clandestine therapeutists, offering the medical profession and the public certain forms of medical treatment, e.g. Aerosol therapy, heat apparatus, and 'plasterers' who will apply plaster of Paris.

These facilities certainly can be a boon to patients requiring them, and prescription of any such treatment by doctors becomes easier, but where will this end? Surely Aerosol should always be given under medical supervision. Some patients are allergic to antibiotics and other aerolysed substances, and they may develop a marked oedematous reaction with the danger of oedema glottidis; and what about the tolerance that the pathogenic bacteria will develop to antibiotics? Severe conditions may progress in spite of therapy and the true nature may be masked.

These forms of treatment should be given by doctors only, or under close medical supervision; and why should we support commercial ventures that attempt to compete with the profession. It is well known that pharmacists all too often prescribe and even diagnose in instances where they are in total ignorance of the condition.

I think it is time the practitioners of this city made a stand against all these clandestine therapeutists.

Anti-Quack.

Johannesburg.
13 May 1950.

PREMATURE TWINS

To the Editor: A few notes on a case of premature twins might be of interest to some colleagues.

The birth weights were 3 lb. and 4 lb. During the first 24 hours they were given a little glucose water. From the second day they got half strength breast milk. As they were good suckers they were put on to the mother's breast on the fourth day.

Fortunately the mother who, incidentally, had had both a stormy pregnancy and delivery, had an abundant supply of milk.

On the tenth day the babies were weighed again. The scale, an accurate one, registered 3 lb. 10 oz. and 4 lb. 10 oz. The weighing was carried out by the matron of the maternity home. There was no oedema. Feeds had been given two-hourly at first and later three-hourly.

Needless to say, all concerned were jubilant and very gratified with this large gain in weight.

The subsequent weekly gains, though not of the same order, were also extremely satisfactory. On the 17th day they weighed 4 lb. and 5 lb., on the 24th day, 4½ lb. and 5½ lb., on the 31st day, 5 lb. 2 oz. and 6 lb. 2 oz. and now at 38 days they weigh 5 lb. 10 oz. and 6 lb. 12 oz.

At no time since their birth has their condition given the slightest cause for anxiety. Like the character in the fairy tale, they 'just growed and growed'.

I. Hendler,
B.A., M.B., Ch.B.

18 Mullins Road,
Malvern East,
Johannesburg.
14 May 1950.

BLOOD TRANSFUSION IN THE SENATE

To the Editor: The remarks in the Senate about our blood transfusion service inevitably led to letters in the press. It is regrettable that names of first-rate citizens attempting to give real and special service to the country should be dragged in the mud by some who are apparently rather ill-informed on the subject. It seems to me that the trouble with some of the critics must be pure and simple prejudice.

Considering that this is a purely medical affair it would have been wiser to listen to the words of the President of the Medical Council, who obviously does know something about the service—which, by the way, is second to none—and also about the person of his colleague.

Our blood transfusion service has saved many a life and I feel that it is not requesting too much for those alive to testify the fact. It must obviously also be realized that those who do useful work must also be paid, even if there can be some discussion about the salary paid.

In conclusion, it seems strange that the responsible press published letters attacking the Service but deemed it unimportant to enlighten the public by giving the fullest details of this essential service.

The letters published this morning in the *Rand Daily Mail* could have safely been deposited in the waste paper basket with many others no doubt disposed of in this manner.

Si Vis Vitam, Da Sanguinem.

Johannesburg.
15 May 1950.

X-RAY TREATMENT IN DERMATOLOGY

To the Editor: Dr. John Leeming in your issue of 22 April 1950 not only takes Dr. Charlton to task for his X-ray technique in various skin conditions, but goes on to state that he wishes to present the generally accepted views held by modern dermatologists as opposed to those held by some radiologists. As Dr. Leeming makes Dr. Charlton's paper an issue between dermatologists and radiologists, I feel justified in joining in this discussion.

Dr. Leeming's approach to the subject is a little unusual as he states he is giving the accepted views of modern dermatologists without quoting references. I do not think that Dr. Leeming is justified in assuming that other eminent dermatologists agree with him, and he promptly proves that his assumption is wrong by quoting Drs. MacKee and Cipollaro on the subject of the port-wine stain, but he suppresses their view on the treatment of the strawberry naevi.

Drs. MacKee and Cipollaro, who have written the standard text book on X-ray treatment in diseases of the skin, are Professor of Dermatology, and Assistant Professor respectively, of the New York Post Graduate School. Surely they could be included by Dr. Leeming amongst the 'modern' dermatologists.

This is what they say on page 514 on the subject of naevus vasculosus (strawberry marks): 'The results of Beta-ray therapy in naevus vasculosus are so striking, so perfect, that they may be placed among the most notable achievements in radium therapy in the treatment of cutaneous disease.'

The results from Chaoul contact therapy are just as good as those from Beta-rays.

While it is true that very small naevi may disappear, it is not good practice to watch a large naevus growing steadily larger, when one knows that a few exposures of contact therapy will cure the condition without any risk of damage to the skin.

Dabney and Kerr, in *Radiology* (October 1942, **29,** No. 4, page 383), state: 'In spite of the fact that some authors insist that cavernous haemangiomata are self-limited, and they even regress spontaneously, we think they should be treated as soon as detected.'

Pendegrass * a leading radiologist in the U.S.A. holds the same views; and these views are also confirmed by the fact that some of the largest hospitals in the world treat thousands of naevi in children every year by various methods: either CO_2 snow and injections of sodium morrhuate at the Memorial Hospital, New York, or by radiation, which is the more usual form of treatment in the British hospitals. One can hardly assume that none of these hospitals has a modern dermatologist on the staff.

No radiologist of experience attempts to treat the port-wine type of lesion, and Dr. Charlton does not mention it.

One may well be surprised that Dr. Leeming quotes MacKee and Cipollaro to prove his point about the port-wine stain, which Dr. Charlton did not mention, and yet suppresses their views on the treatment of cavernous haemangiomata.

* American Journal of Roentgenology (1948): **60,** 182.

I have no intention of discussing every condition on which Dr. Leeming joins issue with Dr. Charlton. Dr. Leeming mentions conventional methods of treating warts, without saying which he prefers. Dr. Leeming's suggested X-ray dosage will, of course, not remove warts, hence his disappointment.

Frequently diathermy is used, and very often septic ulcers of the feet are the result.

The simplest method of treating warts, in spite of Sir Archibald McIndoe, is to treat either with X-rays or radium. Sir Archibald McIndoe did not give in his paper a full analysis of the cases in which necrosis took place. Warts which have previously been treated by chiropodists and so on, are much more difficult and much more dangerous to treat with X-ray than the wart which has not been treated previously.

Similarly, hyperkeratotic patches clear up readily with X-rays. Why then use diathermy which necessitates injections of local anaesthetics, and ultimately must leave much more scarring than the X-ray treatment does?

Dr. Leeming's remarks on the effect of X-ray on fungi are very illuminating. He states that it is generally agreed by all dermatologists that X-rays have no direct effect. He believes apparently that the ignorant radiologists still think that X-rays injure the fungus.

I would like to draw Dr. Leeming's attention to an ancient textbook on X-ray diagnosis and treatment by Bythel and Barclay, published as long ago as 1912. It states, on page 119, 'The results are in no way due to a direct action upon the micro-organisms themselves'.

One agrees with Dr. Leeming that the greatest caution is necessary in the treatment of melanomata, and their destruction with diathermy is a risky procedure.

His description of what happened at Guy's when a new superficial X-ray plant was installed for the treatment of skin conditions hardly justifies his plea that the dermatologists should order their own treatment, and presumably control their own apparatus. For no less than four weeks the X-ray plant was used, while no X-ray was coming through a 'thick filter'. What, incidentally, is a 'thick filter'? It is this lack of technical knowledge amongst many dermatologists that makes one wonder how they undertake X-ray treatment at all.

I would like to submit the following points to Dr. Leeming and others interested in the subject:

1. It makes no difference who gives the treatment, provided the person giving it knows what he is doing.

2. There is no regulation made by the Medical Council of South Africa, which has hedged round all other specialities with so many rules and regulations, that dermatologists must have a knowledge of X-ray and radium treatment before proceeding to give this form of treatment. All a dermatologist needs is an X-ray machine, and a demonstration by a salesman, lasting 15-20 minutes.

3. X-ray machines for dermatological purposes are relatively inexpensive. They are, therefore, readily acquired. Once the machine is installed, it is difficult for the dermatologist to resist trying it out on many dermatological conditions, whether X-ray is indicated or not. If small doses are given, no harm is generally done. On the other hand, I have seen psoriasis treated persistently with X-rays until epitheliomata have developed.

4. This lack of technical knowledge on the part of some dermatologists is well demonstrated in MacKee and Cipollaro's book, in their discussion on paravertebral treatment for various types of dermatitis. They point out that the technique amongst people who claim results vary from the use of unfiltered rays to filters of 3 mm. Cu, a filter which would let through very little irradiation from the usual dermatological machine generally ranging up to 120 K.V.

The subject who should do the treatment with X-ray machines is not a new one. There is no more reason for a dermatologist to do his own X-ray treatment than for a laryngologist to treat his own patients with carcinoma of the larynx, or a breast surgeon to treat his own cases of carcinoma of the breast and so on, and yet only the dermatologists as a group give X-ray treatment. The only obvious reason is that the small units used by dermatologists are less expensive than the deep-therapy apparatus required for other conditions.

An attempt has been made on a large scale to allow the clinicians to do their own treatment. At the Memorial Hospital in New York, one of the largest cancer hospitals in the world, the surgeons and physicians prescribed their own treatment. The physicians and surgeons, all highly skilled and trained in their own particular specialities, had also had a considerable amount of training in X-ray therapy. Nevertheless, the system was not found satisfactory, and has recently been changed.

If the dermatologists want to do their own treatment, there is no reason why they should not do so, and every reason why they should do so, provided they have some training in X-ray therapy. Under present conditions they are not compelled to have any training.

I have pleaded for many years, at the Medical Association and radiological meetings, that steps should be taken to get X-ray machines registered, so that any person who wants to buy an X-ray machine should have to produce some evidence that he knows how to use it, or has had experience in using it. In this way many of the disasters, which the dermatologists and radiologists see, would be avoided.

Dr. Leeming must be congratulated, however, on making two very good points in his letter. One is that experienced dermatologists are becoming more and more cautious with their radiotherapy because they have seen so many late ill effects. I noted this on a visit to England last year. The other point is that malignant disease of the skin should be treated by the radiologist.

Some of my dermatological colleagues in Johannesburg appreciate these two points. Some of them, for many years, have not attempted to treat malignant disease of the skin, in spite of the fact that they have had many years' experience of superficial X-ray therapy. I must add that there are amongst my dermatological colleagues also those who have declined to buy X-ray machines, for the reasons I have already indicated.

It is useless, therefore, to talk of what modern dermatologists or radiologists believe or do, as both views and techniques differ widely amongst each group.

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15 May 1950.

FUTILE RADIOLOGICAL PROCEDURES

To the Editor: There appears to be in Cape Town a demand for the unusual radiological procedure of routinely screening the accessory nasal sinuses when a patient is referred for a radiograph of the chest.

It is recognized by authoritative radiologists that fluoroscopic examination of the sinuses is a futile procedure. It is very often difficult enough to detect subtle changes on a first-class radiograph: how much more so is it then to comment on the presence or absence of pathology from the hazy view seen of the antra, screening at, say, 4 milliamperes. At best one could say that this or that antrum 'appears to be opaque'. What of the finer changes? What of the presence or otherwise of polypi, of small fluid levels, of mucosal thickening? And what of the ethmoidal cells and the sphenoidal sinuses? Are these also to be commented upon by screen examination?

I know of no X-ray department overseas which takes upon itself the responsibility of commenting upon sinus pathology from a screen examination; nor can I find any reference to this method of examination in the literature.

Let the clinician, then, not be lulled into a false sense of security by a report that the sinuses were clear on screen examination. It must be realized that the diagnosis of accessory nasal sinus pathology, or the freedom thereof, can only be obtained from excellent radiographic studies in several views, in association with sound clinical assessment of the case, the latter still being the more important. There are no short cuts.

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